Scroll Liquid Chillers

Model CGWF and CCAF
20 to 60 Tons (60 Hz)
17 to 50 Tons (50 Hz)
Water-Cooled and Condenserless

Built For the Industrial and Commercial Markets



January 2004 CG-PRC012-EN

Introduction

The Trane 20-60 Ton Scroll Liquid Chiller

More Than Just Another "Improved" Chiller
— Advanced Design
— Better Reliability
— Superior Efficiency
— New CH530 Controls
— Better Availability
— Easier To Install and Operate

Design
The Trane scroll compressor is the most advanced scroll compressor in the industry.

Reliability
64 percent fewer compressor parts, compared to reciprocating compressors, mean long and reliable life.

Efficiency
CGWF scroll chillers meet and exceed ASHRAE Standard 90.1 full and part load efficiencies. Part load efficiencies are simply unmatched by reciprocating chillers.

Control
CH530 controls enable scrolling access to inputs and operating information via the LCD touch-screen display. Job-specific communication options allow greater reporting flexibility. The CH530 is compatable with LonMark communications.

Availability
Fast ship cycles on both stock and built-to-order specials.

Installation
Small unit size, factory wiring, easy lifting provisions, and start-up control logic mean quick and easy setup. Chillers fit through standard single-width door.

Operation
Smart safety features and over 60 diagnostic displays mean easy and virtually trouble-free operation.



Contents

Features and Benefits

Trane Value Means Fast Availability, Easy Installation and Quality Service

Packed Stock For Fast Delivery
When your project is a fast-track job, Trane can help. A wide range of chillers are stocked and can be shipped soon after receipt of your order.

Build To Order
Need a special chiller fast? Think Trane scroll chillers. New manufacturing technology and inventory control means the fastest delivery schedule in the industry. Wide array of standard options provides the right chiller for the job fast.

Installation

- Only one power connection hook-up — for fast and inexpensive installation.
- Integrated Comfort™ system means only single pair connections are required for control interfaces and therefore, lower total installation costs.
- Factory refrigerant and oil charged units help speed installation.
- All units easily fit through a standard single width door.
- CH530 provides a wealth of information.
- Factory testing of all Trane equipment ensures the system works, allowing smoother start-up & reducing follow-up costs.

Easy Serviceability
Trane 20 through 60 ton scroll chillers are designed with service personnel in mind. All major components are replaceable without complete unit disassembly. Plus, CH530 provides diagnostic capability to aid service personnel in analyzing problems. Therefore, if a problem does occur, the chiller can be up and running in a shorter period of time.

Single-Source Responsibility
A wide range of products designed for complete compatibility are available with the scroll chillers. Your entire building comfort system can be completed using components from Trane.

The Added Value of Applications Expertise
You get a quality chiller, properly selected and applied in a properly designed system. That means a comfort system that works, the first time!

The standard ARI rating condition (54/44°F and 85°F/3.0 gpm per ton) and IPLV are ARI certified. All other ratings, including the following, are outside the scope of the certification program and are excluded:

- Glycol.
- 50 Hz.
- Condenserless models CCAF.

Water Chiller Systems Business Unit

ASHRAE Standard 90.1 All Trane chillers meet and exceed the new efficiency levels mandated by ASHRAE Standard 90.1. This new standard requires higher efficiencies than past technologies can deliver. It mandates higher efficiency levels for scroll water chillers in comparison to reciprocating chillers. In fact, energy efficiency is so paramount the US Federal Government has adopted standard 90.1. Federal Executive Order mandates energy consuming devices procured must be in the top 25% of their class. In the case of chillers, ASHRAE 90.1 is the product standard for measurement.

Risk. Not only has ASHRAE 90.1 been adopted by the US Federal Government, it's expected to be adopted domestically, if not globally, in the future. Make sure that your chillers as well as your entire HVAC system complies, or you may be caught retrofitting your project with new equipment and paying extra design dollars if the code changes during construction.

Trane's CGWF was designed with the end user's requirements in mind. Efficiency and reliability were primary design concerns with this latest generation machine.

Operating Torque

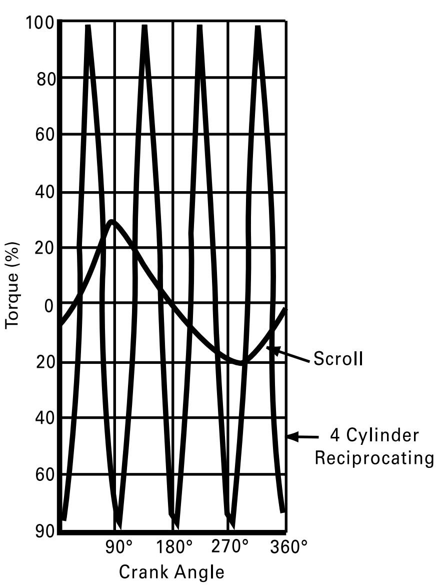


Chart illustrates low torque variation of the Trane scroll compressor vs reciprocating compressor.

Leading in Efficiency and Reliability with State-Of-The-Art Scroll Compressor Technology

Efficiency

The energy efficiency of the scroll chiller results in energy costs lower than any other comparable chiller. Full load efficiencies are improved beyond reciprocating chillers, but part load efficiencies are simply unmatched by any other manufacturer.

Superior efficiencies are obtained by combining many of the traditional scroll chiller energy efficient features with the Trane scroll compressor technology. HERE'S HOW:

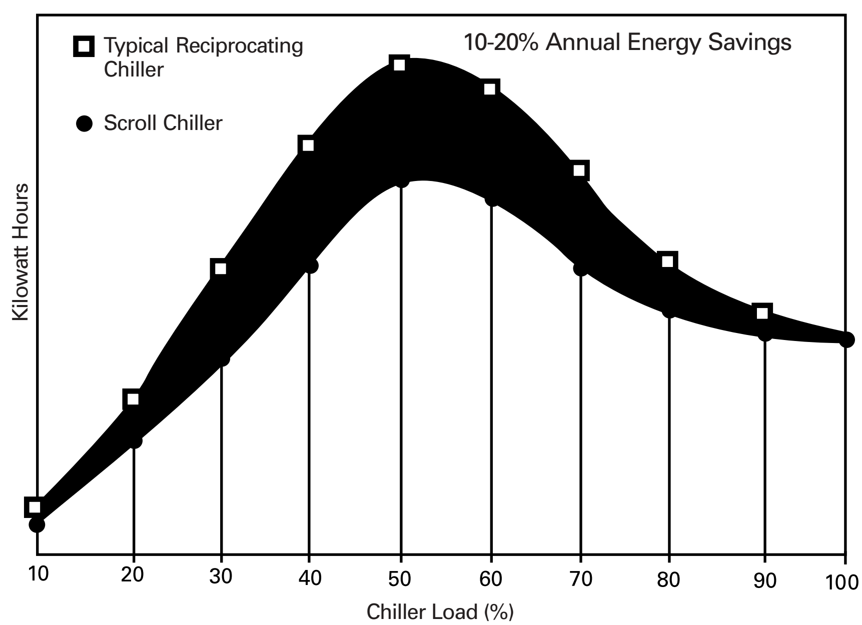
- Scroll compressor's positive displacement design
- Dual refrigerant circuits (40-60 ton units)
- Multiple compressors
- Optimum system design
- Reduced friction
- No valves
- Advanced heat transfer surfaces

Reliability

The Trane scroll chiller with many new improvements, now brings an exciting new compressor to the commercial market — the Trane scroll compressor. Trane has designed the scroll compressor to be a leader in reliability. HERE'S HOW:

- Simple design with 64 percent fewer parts than equal capacity reciprocating compressor.
- Scroll compliance allows liquid and dirt to pass through without damaging compressor (liquid slugging resistant).
- Advanced microelectronics protect both compressor and motor from typical electrical fault conditions.
- Scroll compressors have less than a third the torque variations of a reciprocating compressor.
- Years of laboratory testing have optimized compressor and chiller systems reliability.
- Water-cooled scroll chillers are factory tested.

Scroll Chiller Energy Usage Savings

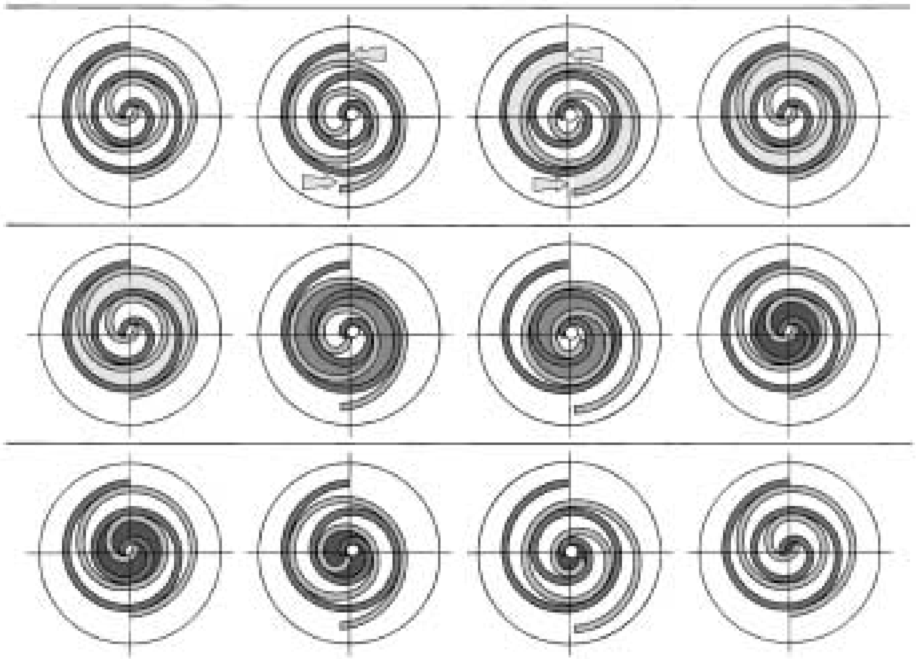


Graph illustrates Trane scroll chiller's superior annual energy costs vs typical reciprocating chillers.

Features and Benefits

World Class Efficiency & Reliability

Trane Scroll Compressor — Maximum Efficiency with Enhanced Reliability



General
The scroll compressor has two scrolls. The top scroll is fixed and the bottom scroll orbits. Each scroll has walls in a spiral shape that intermesh.

Inlet-First Orbit
As the bottom scroll orbits, two refrigerant gas pockets are formed and enclosed.

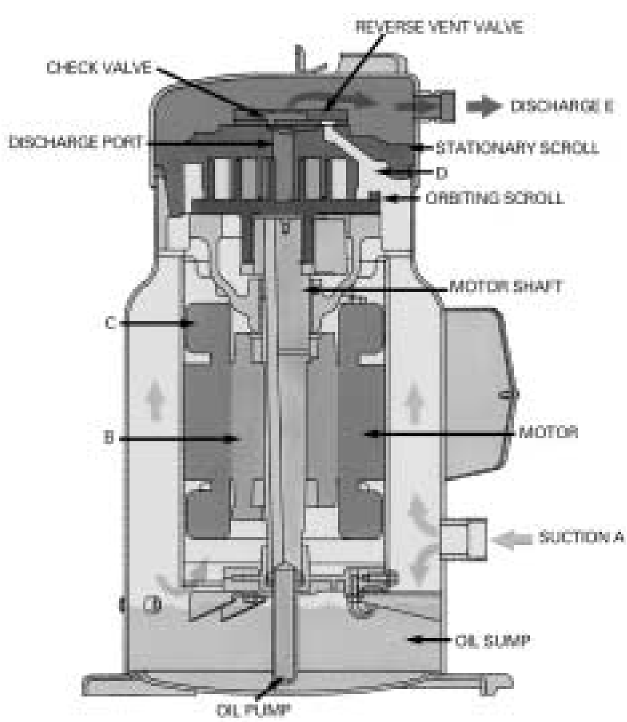
Compression-Second Orbit
The refrigerant gas is compressed as the volume is reduced closer to the center of the scroll.

Discharge-Third Orbit
The gas is compressed further and discharged through a small port in the center of the fixed scroll.

Scroll Principal Components
This is a cutaway view of a hermetic, scroll compressor, showing the relative positions of the principal components. Shown is a Trane 10-ton, 3600 rpm, 60 Hz [3000 rpm, 50 Hz] scroll compressor as an example.

The principle of operation of this example compressor is as follows: The suction gas is drawn into the compressor at A. The gas then passes through the gap between the rotor and stator, B, cooling the motor, before it enters the compressor housing, C. Here, the velocity of the gas is reduced, causing a separation of the entrained oil from the gas stream. The gas then enters the intake chamber, D, that encircles the scrolls.

Finally, the suction gas is drawn into the scroll assembly where it is compressed and discharged into the dome of the compressor. The dome of this example compressor acts as a hot gas muffler which dampens the pulsations before the gas enters the discharge line, E.



Features and Benefits Options

Options

Hot Gas Bypass: Hot gas bypass option allows unit operation below the minimum step of unit unloading. The regulator valve, along with all associated refrigerant piping and electrical wiring, are factory installed and tested on one refrigeration circuit. Unit does not start in hot gas bypass mode. If the unit operates in bypass mode for 30 minutes without a call for cooling, it will pump down and shut off. Unit starts immediately upon a further call for cooling.

Chilled Water Reset: Front panel settable control, microprocessor based control strategy, and field-installed sensor for ambient temperature based reset are included in this option. Return water reset sensor is standard, but panel controller and control strategy must be ordered as an option.

Tracer Summit Communication Interface: Permits bi-directional communication to the Trane Integrated Comfort system.

LonTalk LCI-C Communication Interface: Provides the LonMark chiller profile inputs/outputs for use with a generic building automation system.

Remote Input Options
Remote chilled water setpoint input (4-20mA/2-10Vdc), compressor inhibit which locks out the second compressor on each circuit reducing the kW draw or both.

Control Output Options
Programmable relays provided to indicate: Compressor running, maximum capacity, chiller limit mode, warning (informational diagnostic), alarm latching (shutdown diagnostic), alarm nonlatching (shutdown diagnostic), alarm latching or nonlatching.

Ice Making Controls: In ice-making mode, the unit will operate fully loaded in response to jobsite supplied contact closure. Ice making will terminate when the return fluid temperature falls below an adjustable setpoint (minimum 20°F [-6.7°C]). When not in ice making mode, unit will provide modulating capacity control based on leaving chilled fluid temperature (20-55°F) [-6.7°C to 12.8°C].

Unit Mounted Disconnect Switch: Non-fused molded case disconnect switch factory installed in control panel for disconnecting main three-phase power.

Isolators: Neoprene-in-shear isolators for field installation under unit frame.

Sound Attenuation: Factory-installed acoustical attenuation for applications where extremely low sound level is required.

Water Regulating Valves: Field-installed valves provide means for control of head pressure.

Outdoor Temperature Sensor: Field-installed outdoor temperature sensor with an adjustable setpoint provides means for low ambient lockout.

Condenser Water Temperature Sensor: Factory installed temperature sensor provided for microprocessor display.

Controls

Human Interfaces

The Trane water-cooled 20-60 ton scroll CGWF chiller offers an easy-to-use operator interface panel, the DynaView.

DynaView is an LCD touchscreen display that is navigated by file tabs. This is an advanced interface that allows the user to access any important information concerning setpoints, active temperatures, modes, electrical data, pressures, and diagnostics.

Safety Controls

A centralized main processor offers a higher level of machine protection. Since the safety controls are smarter, they limit compressor operation to avoid compressor or evaporator failures, thereby minimizing nuisance shutdown. Tracer™ Chiller Controls (CH530) directly senses the control variables that govern the operation of the chiller: evaporator pressure and condenser pressure. When any one of these variables approaches a limit condition where damage may occur to the unit or shutdown on a safety, Tracer Chiller Controls takes corrective action to avoid shutdown and keep the chiller operating. This happens through compressor shedding. Tracer Chiller Controls optimizes total chiller power consumption during normal operating conditions. During abnormal operating conditions, the microprocessor will continue to optimize chiller performance by taking the corrective action necessary to avoid shutdown. This keeps cooling capacity available until the problem can be solved. Whenever possible, the chiller is allowed to perform its function; making chilled water. Overall, the safety controls help keep the building or process running and out of trouble.

Figure C1. DynaView operator interface



Standalone Controls

Interface to standalone units is very simple; only a remote auto/stop for scheduling is required for unit operation. Signals from the chilled water pump contactor auxiliary or a flow switch are wired to the chilled waterflow interlock. Signals from a time clock or some other remote device are wired to the external auto/stop input.

Standard Features

- **External Auto/Stop** — A jobsite provided contact closure will turn the unit on and off.
- **Chilled Water Flow Interlock** — A jobsite provided contact closure from a chilled water pump contactor and/or a flow switch is required and will allow unit operation if a load exists and flow is proven. This feature will allow the unit to run in conjunction with the pump system.
- **Emergency Stop** — A jobsite supplied contact opening wired to this input will turn the unit off and require a manual reset of the unit microcomputer. This closure is typically triggered by a jobsite supplied system such as a fire alarm.
- **Chilled Water Pump Control** — Unit controls provide an output to control the chilled water pump(s). One contact closure to the chiller is all that is required to initiate the chilled water system.
- **Chilled Water Temperature Reset** — Reset can be based on return water temperature or outdoor air temperature (optional).
- **Condenser Water Pump Control** — Unit controls provide an output to control the condenser water pump(s). One contact closure to the chiller is all that is required to initiate the chilled water system.
- **Condenser Water Flow Protection** — A jobsite supplied contact closure from a flow switch or pressure switch is required and will shut down the unit if flow is lost.

Controls

Easy Interface to A Generic Building Management System
Controlling the scroll CGWF chiller with building management systems is state-of-the-art, yet simple with either the LonTalk Communications Interface for Chillers (LCI-C) or Generic Building Management System Hardwire Points.

Simple Interface with Other Control Systems
CH530 controls afford simple interface with other control systems, such as time clocks, building automation systems, and ice storage systems. This means you have the flexibility to meet job requirements while not having to learn a complicated control system. This setup has the same standard features as a stand-alone water chiller, with the possibility of having additional optional features.

What are LonTalk, Echelon, and LonMark?
LonTalk is a communications protocol developed by the Echelon Corporation. The LonMark association develops control profiles using the LonTalk communication protocol. LonTalk is a unit level communications protocol, unlike BACNet used at the system level.

LonTalk Communications Interface for Chillers (LCI-C)

LonTalk Communications Interface for Chillers (LCI-C) provides a generic automation system with the LonMark chiller profile inputs/outputs. The inputs/outputs include both mandatory and optional network variables. Note: LonMark network variable names are in parentheses when different from chiller naming convention.

Chiller Inputs:
- Chiller Enable/Disable
- Chilled Liquid Setpoint (Cool Setpoint)
- Compressor Inhibit
- Chiller Mode (Ice Making)

Chiller Enable/Disable
Allows for chiller to be started or stopped depending on if certain operating conditions are met.

Chilled Water Setpoint
Allows for the external setting independent of the front panel setpoint to adjust the leaving water temperature setpoint.

Compressor Inhibit
Locks out the second compressor on each circuit, reducing the kW draw.

Ice Making
Provides interface with ice making control systems. Please refer to page 11 for more information.

Chiller Outputs:
- On/Off
- Active Setpoint
- Average Percent RLA
- Compressor Inhibit
- Compressor Starts
- Compressor Run Times
- Leaving Chilled Water Temperature
- Entering Chilled Water Temperature
- Evaporator Refrigerant Temperature
- Evaporator Refrigerant Pressure
- Evaporator Water Pump Request & Flow Status
- Leaving Condenser Water Temperature
- Entering Condenser Water Temperature
- Condenser Refrigerant Temperature
- Condenser Refrigerant Pressure
- Condenser Water Pump Request & Flow Status
- Outdoor Air Temperature (CCAF)
- Alarm Descriptor
- Chiller Status

Active Setpoint
Indicates the current value of the leaving water temperature setpoint

Average Percent RLA
Provides the current capacity level via % RLA

Compressor Starts and Run Times
Provides the number of starts and run time for each compressor

Alarm Descriptor
Provides alarm messages based on pre-determined criteria

Chiller Status
Indicates the running modes and states of the chiller, i.e. Running in alarm mode, chiller enabled, chiller being locally controlled, etc…

Generic Building Management System Hardwire Points

GBAS may be achieved via hardware input/output as well. The input/outputs are as follows:

Chiller Hardwire Inputs Include:
- Chiller Enable/Disable
- Circuit Enable/Disable
- External Chilled Water Setpoint
- Compressor Inhibit
- Ice Making Enable

Programmable Relays and Alarms
The unit provides seven output options, of which four can be chosen.
a) Compressor running indication
b) Maximum capacity
c) Chiller limit mode
d) Warning informational diagnostic indication
e) Alarm latching shutdown diagnostic indication
f) Alarm nonlatching shutdown diagnostic indication
g) Alarm latching or nonlatching shutdown diagnostic indication

Controls

Tracer Summit controls — Interface With The Trane Integrated Comfort System (ICS)

Trane Chiller Plant Control
The Tracer Summit Chiller Plant Building Management System with Chiller Plant Control provides building automation and energy management functions through stand-alone control. The Chiller Plant Control is capable of monitoring and controlling your entire chiller plant system.

Application software available:
• Time-of-day scheduling
• Demand limiting
• Chiller sequencing
• Process control language
• Boolean processing
• Zone control
• Reports and logs
• Custom messages
• Run time and maintenance
• Trend log
• PID control loops

And of course, the Trane Chiller Plant Control can be used on a stand-alone basis or tied into a complete building automation system.

When the scroll CGWF chiller is used in conjunction with a Trane Tracer™ Summit system, the unit can be monitored and controlled from a remote location. The chiller can be controlled to fit into the overall building automation strategy by using time of day scheduling, timed override, demand limiting, and chiller sequencing. A building owner can completely monitor the chiller from the Tracer system, since all of the monitoring information indicated on the unit controller's microcomputer can be read off the Tracer system display. In addition, all the powerful diagnostic information can be read back at the Tracer system. Best of all, this powerful capability comes over a single twisted pair of wires! The scroll liquid chillers can interface with many different external control systems, from simple stand-alone units to ice making systems.

A single twisted pair of wires tied directly between the CGWF chiller and a Tracer™ Summit system provides control, monitoring and diagnostic capabilities. Control functions include auto/stop, adjustment of leaving water temperature setpoint, compressor operation lockout for kW demand limiting and control of ice making mode. The Tracer system reads monitoring information such as entering and leaving evaporator water temperatures and outdoor air temperature. Over 60 individual diagnostic codes can be read by the Tracer system. In addition, the Tracer system can provide sequencing control for up to 25 units on the same chilled water loop. Pump sequencing control can be provided from the Tracer system. Tracer ICS is not available in conjunction the external setpoint capability.

Required Options
Tracer Interface

External Trane Devices Required
Tracer Summit™, Tracer 100 System or Tracer Chiller Plant Control

Additional Features That May Be Used
Ice Making Control

Controls

Trane Chiller Plant Automation
Trane's depth of experience in chillers and controls makes us a well-qualified choice for automation of chiller plants using scroll liquid chillers. The chiller plant control capabilities of the Trane Tracer Summit® building automation system are unequaled in the industry. Our chiller plant automation software is fully pre-engineered and tested. It is a standard software application, not custom programming which can prove to be difficult to support, maintain, and modify.

Energy Efficiency
Trane chiller plant automation intelligently sequences starting of chillers to optimize the overall chiller plant energy efficiency. Individual chillers are designated to operate as base, peak, or swing based on capacity and efficiency. Sophisticated software automatically determines which chiller to run in response to current conditions. The software also automatically rotates individual chiller operation to equalize runtime and wear between chillers.

Trane chiller plant automation enables unique energy-saving strategies. An example is controlling pumps, and chillers from the perspective of overall system energy consumption. The software intelligently evaluates and selects the lowest energy consumption alternative.

Keeping Operators Informed
A crucial part of efficiently running a chiller plant is assuring that the operations staff is instantly aware of what is happening in the plant. Graphics showing schematics of chillers, piping, pumps, and towers clearly depict the chiller plant system, enabling building operators to easily monitor overall conditions. Status screens display both current conditions and upcoming automated control actions to add or subtract chiller capacity. CGWF and other chillers can be monitored and controlled from a remote location.

Tracer Summit features standard report templates listing key operating data for troubleshooting and verifying performance. Reports for each type of Trane chiller and three and six-chiller systems are also standard. Detailed reports showing chiller runtimes aid in planning for preventative maintenance.

Swift Emergency Response
We understand the importance of maintaining chilled water production while protecting your chillers from costly damage. If no water flow is detected to a chiller's piping, the start sequence is aborted to protect the chiller. The next chiller in the sequence is immediately started to maintain cooling.

In the event of a problem, the operator receives an alarm notification and diagnostic message to aid in quick and accurate troubleshooting. A snapshot report showing system status just prior to an emergency shutdown helps operators determine the cause. If emergency conditions justify an immediate manual shutdown, the operator can override the automatic control.

Easy Documentation for Regulatory Compliance
Comprehensive documentation of refrigerant management practices is now a fact of life. Trane chiller plant automation generates the reports mandated in ASHRAE Guideline 3.

Integrated Comfort™ Capabilities
When integrated with a Tracer Summit building management system performing building control, Trane chiller plant automation coordinates with Tracer Summit applications to optimize the total building operation. With this system option, the full breadth of Trane's HVAC and controls experience are applied to offer solutions to many facility issues. If your project calls for an interface to other systems, Tracer Summit can share data via BACnet™, the ASHRAE open systems protocol.

Ice Making Systems Controls
An ice making option may be ordered with the 20-60 ton scroll liquid chiller. CH530 will accept a command to initiate ice making. When in the ice making mode, the chiller will be fully loaded and will continue to operate until the ice command is removed or the evaporator entering water temperature reaches the active ice termination setpoint. If terminated on the evaporator entering water temperature, CH530 will not allow the chiller to restart until the ice making command is removed.

Additional Options That May Be Used In Conjunction
Failure Indication Contacts
Communications Interface (For Tracer Systems)
Chilled Water Temperature Reset

Application Considerations

Unit Location
Units should be installed indoors where exposure to rain or water splash is minimal. A level foundation or flooring must be provided which will support at least 150 percent of the operating weight of the unit. The chiller foundation must be rigid to reduce vibration transmission to a minimum. Use of vibration isolators is recommended for applications with sensitive vibration and noise criteria.

Allow service clearance for compressor removal as well as evaporator and condenser tube removal.

Condenser Water Limitations
Water-cooled scroll chillers start and operate satisfactorily over a range of load conditions with uncontrolled entering water temperature.

Reducing the condenser water temperature is an effective method of lowering the power input required. However, by reducing the condenser water temperature beyond certain limits, the effect causes a reduction in the pressure drop across the thermal expansion valve to a point when system instability may occur.

In general, continuous machine operation with entering condenser water temperature below 60°F [15.5°C] is not recommended. When the condenser water temperature is expected to drop below 60°F [15.5°C], it is recommended that some form of condenser water temperature control be used to ensure optimal machine performance.

Water Treatment
Use of untreated or improperly treated water in chillers may result in scaling, erosion, corrosion, algae or slime. It is recommended that the services of a qualified water treatment specialist be engaged to determine what treatment, if any, is advisable. Trane assumes no responsibility for the results of untreated, or improperly treated water.

Water Pumps
Avoid specifying or using 3600 rpm, 60 Hz [3000 rpm, 50 Hz] condenser water and chilled water pumps. Such pumps may operate with objectional noise and vibration. In addition, a low frequency beat may occur due to the slight difference in operating rpm between water pumps and scroll compressor motors. Where noise and vibration-free operation is important, Trane encourages the use of 1750 rpm, 60 Hz [1450 rpm, 50 Hz] pumps.

Remote Condenser
Remote condensers should be located as close as possible to the chiller to ensure minimum pressure drops of discharge refrigerant. If non-Trane condensers are provided, a subcooling circuit must be provided in order to achieve cataloged performances (16°F [-8.9°C] subcooling).

Model Number Description

Model Number Description

CGW	F	020	4	C	A0	U	A	A	1	C	L	1	D	0	N	N	0	0	N	0	X	0	X
1,2,3	4	5,6,7	8	9	10,11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29

Digits 01, 02, 03, – Chiller series
CGWF = Water cooled scroll chiller
CCAF = Scroll compressor chiller (condenserless)

Digits 04, – Development sequence

Digits 05, 06, 07 – Unit nominal tonnage
020 = 20 Nominal tons
025 = 25 Nominal tons
030 = 30 Nominal tons
040 = 40 Nominal tons
050 = 50 Nominal tons
060 = 60 Nominal tons

Digit 08 – Unit voltage
G = 208-230/60/3
D = 380/60/3
N = 400/50/3
4 = 460/60/3
5 = 575/60/3

Digit 09 – Ship Cycle
C = Made to order
(C) = Packed stock (Contact BU)

Digit 10, 11 – Design sequence
XX = Factory/ABU assigned

Digit 12 – Agency listing
N = No agency listing
U = C/UL listing

Digit 13 – Pressure vessel code
A = ASME code
C = Canadian code

Digit 14 – Shipping package
A = Ship via flat bed truck
B = Ship w/shrink wrap bag and skid
C = Ship w/skid

Digit 15 – Condenser temperature range
0 = None - CCAF units
1 = Standard 60-90°F [15.6-32.2°C] entering water temp
4 = High 90-130°F [32.2-54.4°C] entering water temp

Digit 16 – Condenser tube material
N = None - CCAF units
C = Std copper finned tubes

Digit 17 – Condenser water connections
N = None - CCAF units
L = Left hand cond water connections (default)
R = Right hand cond water connections

Digit 18 – Evaporator temperature range
1 = Standard cooling 40-60°F [4.4-15.6°C]
2 = Ice making 26-39°F [-3.3-3.9°C]
3 = Low temp 10-25°F [-12.2-(-3.9)°C]
4 = Standard cooling/Ice making 20-60°F [-6.7-15.6°C]

Digit 19 – Power line connection type
T = Terminal block
D = Non-fused disconnect switch

Digit 20 – Short circuit rating
0 = No short circuit rating
1 = With short circuit rating

Digit 21 – Control input options
N = No options
R = Remote chilled water setpoint input
C = Remote compressor inhibit and/or icemaking input
B = Remote CWS and compressor inhibit/icemaking input

Digit 22 – Control output options
N = No options
P = Programmable relays for remote alarm, run, etc.

Digit 23 – Auxiliary sensor options
0 = None
1 = Condenser water temp sensors (CGWF only)
2 = Outdoor temp sensor - CWR or Amb Lockout
3 = Both condenser and outdoor temp sensor

Digit 24 – Communication options
0 = None
3 = Tracer Summit interface
5 = LonTalk LCI-C interface

Digit 25 – Hot gas bypass
N = NO HGBP valve/function
H = HGBP function included

Digit 26 – Sound attenuator
0 = No sound attenuator
1 = Sound attenuator - factory installed

Digit 27 – Ship-with accessories - isolators, WRV
X = No ship-with accessories
N = Neoprene isolators
A = 1.5" 2-way water reg valve x 1
B = 2" 2-way water reg valve x 1
C = 2.5" 2-way water reg valve x 1
D = 1.5" 2-way water reg valve x 2
E = 2" 2-way water reg valve x 2
F = 2.5" 2-way water reg valve x 2
G = Neo isolators + 1.5" WRV x 1
H = Neo isolators + 2" WRV x 1
J = Neo isolators + 2.5" WRV x 1
K = Neo isolators + 1.5" WRV x 2
L = Neo isolators + 2" WRV x 2
M = Neo isolators + 1.5" WRV x 2

Digit 28 – Ship-with accessories - flow switches
0 = No flow switches
1 = 150 psi NEMA-1 flow switch (FS4-3) x 1
2 = 150 psi NEMA-1 flow switch (FS4-3) x 2
4 = 150 psi NEMA-4 flow switch (FS8-W) x 1
5 = 150 psi NEMA-4 flow switch (FS8-W) x 2

Digit 29 – Design special
X = Unit has no special features
S = Unit has special design feature

General Data

Table GD-1. General data — CGWF water-cooled chiller

Size		20	25	30	40	50	60
Compressor							
Quantity (1)		2	2	2	2/2	2/2	2/2
Nominal Size (tons) (2)		10/10	10/15	15/15	10-10/10-10	10-15/10-15	15-15/15-15
Steps of Unloading (%)		100,50	100,60	100,50	100,75,50,25	100,80,60,30	100,75,50,25
Evaporator							
Water Storage	(gallons)	12	11	16	13	21	40
	(liters)	45	42	61	49	80	151
Min. Flow	(gpm)	24	30	36	48	60	84
	(L/s)	1.5	1.9	2.3	3.0	3.8	4.7
Max. Flow	(gpm)	72	90	108	144	180	252
	(L/s)	4.5	5.7	6.8	9.1	11.4	17.3
Condenser							
Water Storage	(gallons)	5.0	6.1	7.6	11.7	13.9	14.0
	(liters)	18.9	23.2	28.9	44.2	52.7	53.1
Min. Flow	(gpm)	30	36	50	60	72	90
	(L/s)	1.9	2.3	3.2	3.8	4.5	5.7
Max. Flow	(gpm)	90	108	146	180	216	325
	(L/s)	5.7	6.8	9.2	11.4	13.6	20.5
General Unit							
Refrigerant		R-22	R-22	R-22	R-22	R-22	R-22
No. of Independent Refrigerant Circuits		1	1	1	2	2	2
Refrigerant	(pound)	50	50	90	50/50	50/50	75/75
Charge	(kilogram)	22.7	22.7	40.8	22.7/22.7	22.7/22.7	34/34
Oil Charge	(pints)	16	22	28	16/16	22/22	28/28
	(liters)	7.6	10.4	13.2	7.6/7.6	10.4/10.4	13.3/13.3

Notes
1. Data containing information on two circuits shown as follows: CKT 1/CKT 2
2. Nominal compressor sizes based on 60 Hz.

Table GD-2. General data — CCAF compressor chiller

Size		20	25	30	40	50	60
Compressor							
Quantity (1)		2	2	2	2/2	2/2	2/2
Nominal Size (tons) (2)		10/10	10/15	15/15	10-10/10-10	10-15/10-15	15-15/15-15
Steps of Unloading (%)		100,50	100,60	100,50	100,75,50,25	100,80,60,30	100,75,50,25
Evaporator							
Water Storage	(gallons)	12	11	16	13	21	19
	(liters)	45	42	61	49	80	72
Min. Flow	(gpm)	24	30	36	48	60	84
	(L/s)	1.5	1.9	2.3	3.0	3.8	4.7
Max. Flow	(gpm)	72	90	108	144	180	252
	(L/s)	4.5	5.7	6.8	9.1	11.4	17.3
General Unit							
Refrigerant		R-22	R-22	R-22	R-22	R-22	R-22
No. of Independent Refrigerant Circuits		1	1	1	2	2	2
Refrigerant	(pound)	6	8	12	6/6	8/8	12/12
Charge	(kilogram)	2.7	3.6	5.4	2.7/2.7	3.6/3.6	5.5/5.5
Oil Charge	(pints)	16	22	28	16/16	22/22	28/28
	(liters)	7.6	10.4	13.2	7.6/7.6	10.4/10.4	13.3/13.3

Notes:
1. Data containing information on two circuits shown as follows: CKT 1/CKT 2
2. Nominal compressor sizes based on 60 Hz.

Selection Procedures

The chiller capacity tables on the following pages cover the most frequently encountered leaving water temperatures. For temperature drops other than 10°F [5.6°C], refer to Table SP-1, Performance Adjustment Factors, shown below.

Additional chiller selections and performance information can be obtained through your local Trane sales office.

To select a Trane water-cooled scroll chiller, the following information is required:

1. Design load in tons of refrigeration
2. Design chilled water temperature drop
3. Design leaving chilled water temperature
4. Entering condenser water temperature

Evaporator flow rate (gpm) can be determined by using the following formula:

$$gpm = \frac{\text{Tons} \times 24}{\text{Chilled Water } \Delta T \text{ (F)}}$$

Condenser flow rate (gpm) can be determined by using the following formula:

$$gpm = \frac{24 \times (\text{tons} + (0.285 \times \text{compressor kW})}{\text{Condenser Water } \Delta T \text{ (F)}}$$

Table SP-1. Performance adjustment factors

Fouling Factor	Water Delta T	Capacity	Evap. GPM	kW	Cond. GPM
	8	0.997	1.231	1.000	0.997
0.00010	10	1.000	1.000	1.000	1.000
	12	1.007	0.829	1.001	1.006
	14	1.012	0.714	1.001	1.010
	16	1.017	0.628	1.002	1.014

Note:
This selection procedure is for water only as the solution.

Scroll Liquid Chiller — (CGWF) — Selection Example:

Given:
System Load = 40 tons
Leaving Chilled Water Temperature (LCWT) = 44°F [6.7°C]
Entering Condenser Water Temperature (EWT) = 85°F [29.4°C]
Leaving Condenser Water Temperature (LWT) = 95°F [35°C]
Chilled Water Temperature Drop = 10°F [5.6°C]

1. From Table PD-1 (Performance Data), a CGWF 40 at the given conditions will produce 39.4 tons with a compressor power input of 30.3 kW and a unit EER of 15.6.
2. To determine the evaporator and condenser water pressure drops, the flow rates (gpm) must be determined. Using the formula above, this unit would require an evaporator flow rate of 95 gpm and a condenser flow rate of 115 gpm. (Compressor kW is found in the same table as the capacity.) The Evaporator Pressure Drop Curve, Chart PD-1, indicates that 95 gpm through a 40 ton evaporator results in a pressure drop of 13.8 feet of water. The Condenser Pressure Drop curve, Chart PD-2, indicates 115 gpm through a 40 ton condenser results in a pressure drop of 14 feet of water.
3. The final unit selection is:
   - — Quantity (1) CGWF 40
   - — Cooling Capacity = 39.4 tons
   - — Entering/Leaving Chilled Water Temperatures = 54/44°F [12.2/6.7°C]
   - — Chilled water flow rate = 95 gpm
   - — Evaporator water pressure drop = 13.8 feet
   - — Cooling water flow = 115 gpm
   - — Condenser water pressure drop = 14 feet
   - — Compressor power input = 30.3 kW
   - — Unit EER = 15.6

Compressor Chiller – (CCAF) – Selection Example:

Select the unit for the following conditions:

A compressor chiller is required to produce 45 tons when matched with an air-cooled condenser. The leaving chilled water temperature is 44°F [6.7°C]. The evaporator temperature differential is 10°F [5.6°C]. The ambient temperature is 95°F [35°C].

1. Select the nominal unit size. The performance data is tabulated by leaving chilled water temperature. For example, the standard unit capacities at 44°F [6.7°C] leaving chilled water temperature are found on page 21. The system that best meets the tonnage requirement is a CCAF 50 matched with a CAUC C50. The unit capacity is 47.1 tons with a kW input of 56.3. The compressor chiller EER is 10.0.
2. Calculate the required chilled water flow rate.
3. $gpm = \frac{\text{Tons} \times 24}{\text{Chilled Water } \Delta T \text{ (F)}}$

   From this example,

   $gpm = \frac{47.1 \times 24}{10} = 113$
4. Determine the evaporator water pressure drop. The evaporator water pressure drop is located on page 22. Entering the evaporator chart at 113 gpm, the pressure drop for a CCAF 50 evaporator is 7.9 feet.
5. Unit Selection

   The above procedure shows the proper selection for this example is a CCAF 50 with a CAUB C50 condenser operating as follows:
   - — Capacity = 47.1
   - — Entering/leaving chilled water temperature = 54/44°F [12.2/6.7°C]
   - — Chilled water flow rate = 113 gpm
   - — Evaporator water pressure drop = 7.9 feet
   - — Compressor power input = 56.3
   - — Unit EER = 10.0

Performance Data

Full Load Performance

Table PD-1. 60 Hz CGWF performance data in English units

Evaporator		Entering Condenser Water Temperature (F)														
Leaving Water	Unit	75			80			85			90			95		
Temperature (F)	Size	Tons	kW	EER	Tons	kW	EER	Tons	kW	EER	Tons	kW	EER	Tons	kW	EER
40	20	19.2	13.8	16.7	19.0	14.5	15.7	18.6	15.4	14.6	18.1	16.1	13.5	17.7	17.1	12.4
	25	23.8	17.2	16.5	23.2	18.1	15.4	22.7	19.1	14.3	22.1	20.1	13.2	21.6	21.2	12.2
	30	28.3	20.7	16.4	27.6	21.7	15.3	27.0	22.9	14.1	26.3	24.1	13.1	25.6	25.4	12.1
	40	38.0	27.3	16.8	37.2	28.7	15.6	36.5	30.2	14.5	35.5	31.8	13.4	34.6	33.6	12.4
	50	47.0	34.1	16.6	46.0	35.8	15.4	44.9	37.7	14.3	43.8	39.7	13.2	42.7	41.0	12.2
	60	57.7	42.1	16.4	56.4	44.2	15.3	55.0	46.5	14.2	53.7	49.0	13.1	52.3	51.7	12.1
42	20	20.0	13.9	17.3	19.8	14.6	16.3	19.3	15.4	15.1	18.9	16.2	14.0	18.4	17.1	12.9
	25	24.7	17.3	17.1	24.2	18.2	15.9	23.6	19.2	14.8	23.0	20.2	13.7	22.4	21.3	12.6
	30	29.4	20.8	17.0	28.7	21.8	15.8	28.0	23.0	14.7	27.3	24.2	13.6	26.6	25.5	12.5
	40	39.5	27.4	17.3	38.7	28.8	16.1	37.8	30.3	15.0	36.9	32.0	13.9	36.0	33.8	12.8
	50	48.9	34.2	17.2	47.8	36.0	16.0	46.7	37.9	14.8	45.6	39.9	13.7	44.4	42.1	12.7
	60	59.9	42.3	17.0	58.5	44.4	15.8	57.2	46.7	14.7	55.7	49.2	13.6	54.3	51.9	12.6
44	20	20.8	13.9	17.3	20.5	14.7	16.8	19.9	15.4	15.5	19.6	16.3	14.5	19.1	17.2	12.9
	25	25.7	17.4	17.7	25.1	18.3	16.5	24.5	19.1	15.4	23.9	20.3	14.2	23.3	21.4	13.1
	30	30.6	20.8	17.6	29.9	21.9	16.4	29.2	22.9	15.3	28.4	24.3	14.0	27.7	25.6	13.0
	40	41.1	27.5	17.9	40.2	28.9	16.7	39.4	30.3	15.6	38.4	32.1	14.4	37.4	33.9	13.3
	50	50.8	34.4	17.7	49.7	35.1	16.5	48.6	37.8	15.4	47.4	40.1	14.2	46.2	42.3	13.1
	60	62.1	42.5	17.6	60.7	44.6	16.3	59.4	46.8	15.2	57.9	49.4	14.1	56.4	52.1	13.0
46	20	21.5	14.0	18.5	21.3	14.7	17.4	20.9	15.5	16.2	20.4	16.3	15.0	19.9	17.3	13.8
	25	26.6	17.4	18.3	26.1	18.3	17.1	25.5	19.3	15.8	24.9	20.3	14.7	24.2	21.5	13.5
	30	31.7	20.9	18.2	31.0	22.0	16.9	30.3	23.1	15.7	29.5	24.4	14.5	28.7	25.7	13.4
	40	42.6	27.6	18.5	41.7	29.0	17.3	40.8	30.6	16.0	39.9	32.3	14.8	38.9	34.1	13.7
	50	52.8	34.5	18.4	51.6	36.3	17.1	50.4	38.2	15.9	49.2	40.2	14.7	48.0	42.4	13.6
	60	64.4	42.6	18.1	63.0	44.8	16.9	61.5	47.1	15.7	60.0	49.6	14.5	58.5	52.3	13.4
48	20	22.4	14.0	19.1	22.1	14.8	18.0	21.6	15.6	16.7	21.1	16.4	15.5	20.6	17.3	14.3
	25	27.6	17.5	19.0	27.0	18.4	17.6	26.4	19.4	16.4	25.8	20.4	15.2	25.2	21.6	14.0
	30	32.9	21.0	18.8	32.2	22.1	17.5	31.4	23.2	16.2	30.7	24.5	15.0	29.9	25.8	13.9
	40	44.2	27.8	19.1	43.3	29.2	17.8	42.4	30.7	16.6	41.4	32.4	15.3	40.4	34.2	14.2
	50	54.7	34.6	19.0	53.6	35.4	17.7	52.3	38.3	16.4	51.1	40.4	15.2	49.8	42.6	14.0
	60	66.7	42.8	18.7	65.2	45.0	17.4	63.7	47.3	16.2	62.2	49.8	15.0	60.7	52.5	13.9
50	20	23.2	14.1	19.7	22.9	14.8	18.6	22.4	15.6	17.2	21.9	16.5	16.0	21.4	17.4	14.8
	25	28.7	17.6	19.6	28.0	18.5	18.2	27.4	19.4	16.9	26.8	20.5	15.7	26.1	21.6	14.5
	30	34.1	21.1	19.5	33.4	22.1	18.1	32.6	23.3	16.8	31.8	24.6	15.6	31.0	25.0	14.4
	40	45.9	27.9	19.8	44.9	29.3	18.4	43.9	30.8	17.1	42.9	32.5	15.8	41.9	34.3	14.6
	50	56.8	34.8	19.6	55.5	36.5	18.2	54.3	38.5	16.9	53.0	40.5	15.7	51.7	42.8	14.5
	60	69.1	43.0	19.3	67.6	45.1	18.0	66.0	47.5	16.7	64.5	50.0	15.5	62.9	52.8	14.3

Notes:
1. Rated in accordance with ARI Standard 550/590-98 with fouling factors of 0.0001 in the evaporator and 0.00025 in the condenser.
2. Consult Trane representative for performance at temperatures outside of the ranges shown.
3. kW input is for compressors only.
4. EER = Energy Efficiency Ratio (Btu/watt-hout). Power inputs include compressors and control power.
5. Ratings are based on an evaporator temperature drop of 10°F.
6. Interpolation between points is permissible. Extrapolation is not permitted.

Performance Data

Full Load Performance

Table PD-2. 60 Hz CGWF performance data in Metric units

Evaporator Leaving Water Temperature (C)	Unit Size	Entering Condenser Water Temperature (C) 25 kWo	25 kWi	25 COP	30 kWo	30 kWi	30 COP	35 kWo	35 kWi	35 COP
6	20	70.4	14.2	5.0	67.7	15.5	4.4	64.7	17.1	3.8
	25	87.1	17.7	4.9	83.5	19.4	4.3	79.8	21.8	3.7
	30	104.0	21.2	4.9	99.6	23.2	4.3	95.1	25.6	3.7
	40	139.5	28.0	5.0	133.9	30.7	4.4	128.1	33.8	3.8
	50	172.4	35.0	4.9	165.3	38.3	4.3	157.9	42.2	3.7
	60	211.0	43.2	4.9	202.2	47.3	4.3	193.1	52.0	3.7
8	20	75.7	14.3	5.3	72.7	15.7	4.6	69.6	17.3	4.0
	25	93.5	17.8	5.3	89.8	19.5	4.6	85.8	21.5	4.0
	30	111.4	21.4	5.2	106.8	23.4	4.6	102.0	25.7	4.0
	40	150.3	28.2	5.3	144.5	30.9	4.7	138.3	34.1	4.1
	50	185.3	35.2	5.3	177.7	38.6	4.6	169.9	42.5	4.0
	60	226.0	43.5	5.2	216.8	47.6	4.6	207.2	52.4	4.0
10	20	80.8	14.4	5.6	77.7	15.8	21.7	74.4	17.4	4.3
	25	99.9	17.9	5.6	95.9	19.6	21.5	91.8	21.6	4.8
	30	119.0	21.5	5.5	114.1	23.6	21.4	109.1	25.9	4.2
	40	159.9	28.4	5.6	153.8	31.2	21.8	147.3	34.3	4.3
	50	197.9	35.5	5.6	185.9	35.2	23.3	181.7	42.8	4.2
	60	240.7	43.8	5.5	231.0	48.0	21.2	221.0	52.8	4.2

Notes:
1. Rated in accordance with ARI Standard 550/590-98 with fouling factors of 0.0176 in the evaporator and 0.044 in the condenser.
2. Consult Trane representative for performance at temperatures outside of the ranges shown.
3. kWi input is for compressors only.
4. COP = Coefficient of Performance (kWo/total kW). Total kW include compressors and control power.
5. Ratings are based on an evaporator temperature drop of 5.6°C.
6. Interpolation between points is permissible. Extrapolation is not permitted.

Table PD-3. 50 Hz CGWF performance data in English units

Evaporator Leaving Wate Temperature (F)	Unit Size	Entering Condenser Water Temperature (F) 75 Tons	75 kW	75 EER	80 Tons	80 kW	80 EER	85 Tons	85 kW	85 EER	90 Tons	90 kW	90 EER	95 Tons	95 kW	95 EER
	20	19.2	13.8	16.7	19.0	14.5	15.7	18.6	15.4	14.6	18.1	16.1	13.5	17.7	17.1	12.4
	20	16.8	11.1	18.1	16.4	11.7	16.8	16.0	12.4	15.5	15.6	13.1	14.3	15.3	13.9	13.1
	25	20.7	13.9	17.9	20.3	14.6	16.6	19.8	15.5	15.4	19.4	16.3	14.2	18.9	17.3	13.1
42	30	24.6	16.7	17.7	24.1	17.5	16.5	23.6	18.5	15.3	23.0	19.5	14.1	22.5	20.7	13.0
	40	33.2	21.9	18.2	32.5	23.1	16.9	31.8	24.4	15.6	31.0	25.9	14.4	30.2	27.4	13.2
	50	41.0	27.4	17.9	40.1	28.9	16.7	39.2	30.5	15.5	38.3	32.2	14.3	37.4	34.1	13.1
	60	50.4	33.8	17.9	49.3	35.6	16.7	48.2	37.5	15.4	47.1	39.6	14.3	46.0	41.9	13.2
	20	17.4	11.1	18.8	17.1	11.7	17.4	16.7	12.4	16.1	16.3	13.2	14.9	15.9	13.9	13.7
	25	21.5	13.9	18.6	21.1	14.7	17.3	20.6	15.5	16.0	20.1	16.4	14.8	19.6	17.3	13.6
44	30	25.6	16.7	18.4	25.1	17.6	17.1	24.5	18.5	15.9	24.0	19.6	14.7	23.4	20.7	13.5
	40	34.5	22.0	18.9	33.8	23.2	17.5	33.0	24.5	16.2	32.2	25.9	14.9	31.4	27.5	13.7
	50	42.6	27.5	18.6	41.7	29.0	17.3	40.8	30.6	16.0	39.9	32.3	14.8	38.9	34.2	13.6
	60	52.3	33.9	18.5	51.2	35.7	17.2	50.1	37.6	16.0	48.9	39.7	14.8	47.7	42.0	13.7
	20	18.1	11.2	19.5	17.7	11.8	18.1	17.3	12.4	16.7	16.9	13.2	15.4	16.5	14.0	14.2
	25	22.4	13.9	19.2	21.9	14.7	17.9	21.4	15.5	16.6	20.9	16.4	15.3	20.4	17.4	14.1
46	30	26.6	16.7	19.1	26.0	17.6	17.7	25.5	18.6	16.5	24.9	19.6	15.2	24.3	20.8	14.0
	40	35.8	22.0	19.6	35.1	23.2	18.2	34.3	24.5	16.8	33.5	26.0	15.5	32.7	27.5	14.2
	50	44.3	27.6	19.3	43.3	29.0	17.9	42.4	30.6	16.6	41.4	32.4	15.4	40.4	34.3	14.2
	60	54.2	34.0	19.1	53.1	35.8	17.8	51.9	37.7	16.5	50.8	39.8	15.3	49.5	42.1	14.1
	20	18.8	11.2	20.2	18.4	11.8	18.8	18.0	12.5	17.3	17.6	13.2	16.0	17.2	14.0	14.7
	25	23.2	14.0	19.9	22.7	14.7	18.5	22.2	15.5	17.2	21.7	16.4	15.9	21.2	17.4	14.6
48	30	27.6	16.8	19.7	27.0	17.7	18.4	26.5	18.6	17.0	25.9	19.7	15.8	25.2	20.8	14.5
	40	37.2	22.0	20.3	36.4	23.2	18.8	35.6	24.6	17.4	34.8	26.0	16.1	34.0	27.6	14.8
	50	45.9	27.6	20.0	45.0	29.1	18.6	44.0	30.7	17.2	43.0	32.4	15.9	42.0	34.3	14.7
	60	56.1	34.1	19.8	55.0	35.9	18.4	53.9	37.8	17.1	52.6	40.0	15.8	51.4	42.2	14.6
	20	19.5	11.2	20.9	19.1	11.8	19.4	18.7	12.5	18.0	18.3	13.2	16.6	17.8	14.0	15.3
	25	24.1	14.0	20.6	23.6	14.8	19.2	23.1	15.6	17.8	22.6	16.5	16.4	22.0	17.4	15.1
50	30	28.6	16.8	20.4	28.0	17.7	19.0	27.5	18.7	17.6	26.8	19.7	16.3	26.2	20.9	15.1
	40	38.6	22.1	21.0	37.8	23.3	19.5	37.0	24.6	18.0	36.1	26.1	16.6	35.3	27.6	15.3
	50	47.6	27.7	20.7	46.7	29.1	19.2	45.7	30.8	17.8	44.6	32.5	16.5	43.6	34.4	15.2
	60	58.1	34.2	20.4	57.0	36.0	19.0	55.8	37.9	17.7	54.5	40.1	16.3	53.3	42.3	15.1

Notes:
1. Rated in accordance with ARI Standard 550/590-98 with fouling factors of 0.00010 in the evaporator and 0.00025 in the condenser.
2. Consult Trane representative for performance at temperatures outside of the ranges shown.
3. kW input is for compressors only.
4. EER = Energy Efficiency Ratio (Btu/watt-hour). Power inputs include compressors and control power.
5. Ratings are based on an evaporator temperature drop of 10°F.
6. Interpolation between points is permissible. Extrapolation is not permitted.

Performance Data

Full Load Performance

Table PD-4. 50 Hz CGWF performance data in Metric units

Evaporator Leaving Water Temperature (C)	Unit Size	Entering Condenser Water Temperature (C) 25 kWo	25 kWi	25 COP	30 kWo	30 kWi	30 COP	35 kWo	35 kWi	35 COP
6	20	70.4	14.2	5.0	67.7	15.5	4.4	64.7	17.1	3.8
	20	59.4	11.4	5.2	57.0	12.6	4.5	54.5	14.0	3.9
	25	73.4	14.2	5.2	70.5	15.7	4.5	67.5	17.3	3.9
	30	87.3	17.0	5.1	83.9	18.7	4.5	80.3	20.7	3.9
	40	117.6	22.4	5.2	112.9	24.8	4.6	108.0	27.5	3.9
	50	145.3	28.0	5.2	139.7	30.9	4.5	133.7	34.2	3.9
	60	178.4	34.5	5.2	171.7	38.0	4.5	164.0	41.9	3.9
8	20	63.7	11.4	5.6	61.2	12.6	4.9	58.5	14.0	4.2
	25	78.6	14.3	5.5	75.6	15.7	4.8	72.3	17.4	4.2
	30	93.5	17.1	5.5	89.9	18.8	4.8	86.1	20.8	4.1
	40	126.0	22.5	5.6	121.0	24.8	4.9	115.8	27.8	4.2
	50	155.6	28.2	5.5	149.5	31.0	4.8	143.2	34.3	4.2
	60	190.4	34.7	5.5	183.3	38.2	4.8	175.6	42.2	4.2
10	20	68.1	11.4	6.0	65.4	12.6	5.2	62.7	14.0	4.5
	25	84.0	14.3	5.9	80.8	15.8	5.1	77.4	17.5	4.4
	30	99.9	17.2	5.8	96.2	18.9	5.1	92.2	20.9	4.4
	40	134.8	22.6	6.0	129.5	24.9	5.2	124.2	27.7	4.5
	50	166.4	28.3	5.9	160.1	31.1	5.1	153.4	34.5	4.4
	60	203.0	34.9	5.8	195.3	38.4	5.1	187.2	42.4	4.4

Notes:

1. Rated in accordance with ARI Standard 550/590-98 with fouling factors of 0.0176 in the evaporator and 0.044 in the condenser.
2. Consult Trane representative for performance at temperatures outside of the ranges shown.
3. kWi input is for compressors only.
4. COP = Coefficient of Performance (kWo/total kW). Total kW include compressors and control power.
5. Ratings are based on an evaporator and condenser temperature drop of 5.6°C.
6. Interpolation between points is permissible. Extrapolation is not permitted.

Performance Data

Full Load Performance

Table PD-7. 60 Hz CCAF performance data in English units

Evaporator Leaving Water Temperature (F)	Unit Size	Condenser Size	Entering Condenser Air Temperature (F)											
			85			95			105			115		
			Tons	kW	EER	Tons	kW	EER	Tons	kW	EER	Tons	kW	EER
42	20	CAUC-C20	19.4	19.5	11.8	18.4	21.6	10.1	17.3	23.9	8.6	16.1	26.6	7.2
	20	CAUC-C25	19.7	18.6	12.6	18.7	20.6	10.8	17.6	23.0	9.1	16.5	25.5	7.7
	25	CAUC-C25	24.1	24.9	11.5	22.8	27.6	9.9	21.5	30.6	8.4	20.0	34.0	7.0
	25	CAUC-C30	24.5	23.4	12.5	23.3	26.0	10.7	22.0	28.9	9.1	20.6	32.1	7.7
	30	CAUC-C30	28.8	29.1	11.8	27.3	32.2	10.1	25.7	35.7	8.6	24.1	39.6	7.3
	30	CAUC-C40	29.2	27.0	12.9	27.8	29.9	11.1	26.3	33.2	9.5	24.7	36.9	8.0
	40	CAUC-C40	38.7	38.8	11.9	36.7	43.0	10.2	34.5	47.8	8.6	32.2	53.2	7.2
	40	CAUC-C50	39.1	37.4	12.5	37.1	41.6	10.6	35.0	46.2	9.0	32.7	51.4	7.6
	50	CAUC-C50	47.6	50.2	11.3	45.1	55.6	9.7	42.5	61.8	8.2	39.7	68.4	6.9
	50	CAUC-C60	48.4	47.0	12.3	46.0	52.2	10.5	43.5	58.2	8.9	40.8	64.6	7.6
	60	CAUC-C60	56.9	58.4	11.6	54.0	64.8	10.0	50.9	71.8	8.5	47.6	79.8	7.1
	60	CAUC-C80	57.5	53.6	12.8	54.7	59.6	11.0	51.8	66.4	9.3	48.6	73.8	7.9
44	20	CAUC-C20	20.0	19.7	12.1	19.0	21.8	10.4	17.8	24.2	8.8	16.6	26.8	7.4
	20	CAUC-C25	20.4	18.8	12.9	19.3	20.8	11.0	18.2	23.2	9.3	17.1	25.7	7.9
	25	CAUC-C25	24.9	25.1	11.8	23.6	27.9	10.1	22.2	30.9	8.6	20.7	34.3	7.2
	25	CAUC-C30	25.3	23.7	12.7	24.1	26.3	10.9	22.7	29.2	9.3	21.3	32.4	7.9
	30	CAUC-C30	29.7	29.4	12.1	28.2	32.6	10.3	26.6	36.1	8.8	24.9	40.0	7.4
	30	CAUC-C40	30.2	27.2	13.2	28.8	30.2	11.4	27.2	33.5	9.7	25.6	37.2	8.2
	40	CAUC-C40	39.9	39.2	12.1	37.8	43.4	10.4	35.6	48.2	8.8	33.3	53.6	7.4
	40	CAUC-C50	40.3	37.8	12.7	38.3	42.0	10.9	36.1	46.6	9.2	33.8	51.8	7.8
	50	CAUC-C50	49.1	50.6	11.6	46.6	56.2	9.9	43.9	62.2	8.4	41.0	69.0	7.1
	50	CAUC-C60	50.0	47.4	12.6	47.5	52.6	10.8	44.9	58.6	9.2	42.2	65.2	7.7
	60	CAUC-C60	58.7	58.5	12.0	55.7	65.4	10.2	52.6	72.6	8.7	49.2	80.6	7.3
	60	CAUC-C80	59.3	54.0	13.1	56.5	60.0	11.3	53.5	66.8	9.6	50.3	74.4	8.1
46	20	CAUC-C20	20.7	19.9	12.4	19.6	22.0	10.6	18.4	24.4	9.0	17.2	27.1	7.6
	20	CAUC-C25	21.0	18.9	13.2	20.0	21.0	11.3	18.8	23.4	9.6	17.6	25.9	8.1
	25	CAUC-C25	25.7	25.4	12.1	24.3	28.2	10.3	22.9	31.2	8.8	21.4	34.6	7.4
	25	CAUC-C30	26.2	23.9	13.1	24.9	26.5	11.2	23.5	29.5	9.5	22.0	32.6	8.1
	30	CAUC-C30	30.7	29.7	12.3	29.1	32.9	10.6	27.5	36.4	9.0	25.7	40.4	7.6
	30	CAUC-C40	31.2	27.4	13.6	29.7	30.4	11.7	28.2	33.8	10.0	26.5	37.5	8.4
	40	CAUC-C40	41.1	38.6	12.7	39.0	43.8	10.6	36.8	48.8	9.0	34.4	54.0	7.6
	40	CAUC-C50	41.6	38.0	13.1	39.5	42.2	11.2	37.3	47.0	9.5	35.0	52.2	8.0
	50	CAUC-C50	50.6	51.2	11.8	48.0	56.6	10.1	45.3	62.8	8.6	42.3	69.8	7.2
	50	CAUC-C60	51.6	47.8	12.9	49.1	53.2	11.0	46.4	59.0	9.4	43.6	65.6	7.9
	60	CAUC-C60	60.5	59.4	12.2	57.5	66.0	10.4	54.3	73.2	8.9	50.9	81.2	7.5
	60	CAUC-C80	61.2	54.4	13.4	58.3	60.6	11.5	55.2	67.4	9.8	52.0	75.0	8.3

Notes:
1. Ratings based on sea level altitude and evaporator fouling factor of 0.00010.
2. Consult Trane representative for performance at temperatures outside of the ranges shown.
3. kW input is for compressors only.
4. EER = Energy Efficiency Ratio (Btu/watt-hour). Power inputs include compressors and control power.
5. Ratings are based on an evaporator temperature drop of 10°F.
6. Interpolation between points is permissible. Extrapolation is not permitted.
7. Rated in accordance with ARI Standard 550/590-98.

Table PD-8. 60 Hz CCAF performance data in English units

Evaporator Leaving Water Temperature (F)	Unit Size	Condenser Size	Entering Condenser Air Temperature (F)											
			85			95			105			115		
			Tons	kW	EER	Tons	kW	EER	Tons	kW	EER	Tons	kW	EER
48	20	CAUC-C20	21.3	20.1	12.6	20.2	22.2	10.8	19.0	24.6	9.2	17.7	27.3	7.7
	20	CAUC-C25	21.7	19.1	13.5	20.6	21.2	11.6	19.4	23.6	9.8	18.2	26.2	8.3
	25	CAUC-C25	26.5	25.7	12.3	25.1	28.4	10.5	23.7	31.5	9.0	22.1	34.9	7.6
	25	CAUC-C30	27.0	24.1	13.4	25.7	26.7	11.5	24.3	29.6	9.8	22.8	32.9	8.3
	30	CAUC-C30	31.6	30.0	12.6	30.1	33.2	10.8	28.4	36.8	9.2	26.6	40.7	7.8
	30	CAUC-C40	32.2	27.7	13.9	30.7	30.7	11.9	29.1	34.1	10.2	27.4	37.8	8.7
	40	CAUC-C40	42.4	40.0	12.6	40.2	44.4	10.8	37.9	49.2	9.2	35.5	54.6	7.8
	40	CAUC-C50	42.8	38.4	13.3	40.7	42.6	11.4	38.5	47.4	9.7	36.1	52.6	8.2
	50	CAUC-C50	52.2	51.6	12.1	49.5	57.2	10.3	46.7	63.4	8.8	43.7	70.2	7.4
	50	CAUC-C60	53.2	48.2	13.2	50.6	53.6	11.3	47.9	59.6	9.6	45.0	66.2	8.1
	60	CAUC-C60	62.4	60.2	12.4	59.3	66.6	10.6	56.0	74.0	9.1	52.5	82.0	7.7
	60	CAUC-C80	63.1	54.8	13.8	60.2	61.8	11.8	57.0	67.8	10.1	53.7	75.4	8.5
50	20	CAUC-C20	21.9	20.3	12.8	20.8	22.5	11.0	19.6	24.9	9.4	18.3	27.6	7.9
	20	CAUC-C25	22.3	19.3	13.8	21.2	21.4	11.8	20.1	23.8	10.1	18.8	26.4	8.5
	25	CAUC-C25	27.3	25.9	12.6	25.9	28.7	10.8	24.4	31.8	9.2	22.9	35.2	7.8
	25	CAUC-C30	27.9	24.3	13.7	26.5	26.9	11.8	25.1	29.9	10.0	23.5	33.1	8.5
	30	CAUC-C30	32.6	30.3	12.8	31.0	33.6	11.0	29.3	37.2	9.4	27.5	41.1	8.0
	30	CAUC-C40	33.2	27.9	14.2	31.7	30.9	12.2	30.0	34.3	10.4	28.3	38.1	8.9
	40	CAUC-C40	43.6	40.4	12.9	41.4	44.8	11.0	39.1	49.6	9.4	36.6	55.0	8.0
	40	CAUC-C50	44.1	38.8	13.6	42.0	43.0	11.7	39.7	47.8	9.9	37.2	53.0	8.4
	50	CAUC-C50	53.7	52.2	12.3	51.0	57.8	10.5	48.1	64.0	9.0	45.1	71.0	7.6
	50	CAUC-C60	54.8	48.6	13.5	52.2	54.0	11.5	49.4	60.0	9.8	46.4	66.6	8.3
	60	CAUC-C60	64.3	60.8	12.6	61.1	67.4	10.8	57.8	74.6	9.3	54.2	82.8	7.8
	60	CAUC-C80	65.1	55.4	14.0	62.1	61.4	12.1	58.8	68.4	10.3	55.4	76.0	8.7

Notes:
1. Ratings based on sea level altitude and evaporator fouling factor of 0.00010.
2. Consult Trane representative for performance at temperatures outside of the ranges shown.
3. kW input is for compressors only.
4. EER = Energy Efficiency Ratio (Btu/watt-hour). Power inputs include compressors and control power.
5. Ratings are based on an evaporator temperature drop of 10°F.
6. Interpolation between points is permissible. Extrapolation is not permitted.
7. Rated in accordance with ARI Standard 550/590-98.

TRANE®

Performance Data

Full Load Performance

Table PD-9. 60 Hz CCAF performance data in Metric units

Evaporator Leaving Water Temperature (C)	Unit Size	Condenser Size	Entering Condenser Air Temperature (C)											
			30			35			40			45		
			kWo	kWi	COP	kWo	kWi	COP	kWo	kWi	COP	kWo	kWi	COP
	20	CAUC-C20	69.4	19.8	3.5	66.2	21.7	3.0	62.5	23.8	2.6	58.7	26.2	2.2
	20	CAUC-C25	70.7	18.9	3.7	67.3	20.7	3.2	63.8	22.9	2.8	60.3	25.1	2.4
	25	CAUC-C25	86.2	25.3	3.4	82.1	27.8	2.9	77.8	30.5	2.5	73.1	33.5	2.2
	25	CAUC-C30	87.8	23.8	3.7	84.0	26.2	3.2	79.7	28.8	2.8	75.2	31.7	2.4
6	30	CAUC-C30	103.0	29.6	3.5	98.2	32.4	3.0	93.1	35.6	2.6	87.9	39.1	2.2
	30	CAUC-C40	104.7	27.4	3.8	100.3	30.1	3.3	95.3	33.1	2.9	90.2	36.4	2.5
	40	CAUC-C40	138.4	39.5	3.5	131.9	43.3	3.0	124.8	47.6	2.6	117.5	52.4	2.2
	40	CAUC-C50	140.0	38.1	3.7	133.6	41.9	3.2	126.8	46.0	2.7	119.5	50.7	2.3
	50	CAUC-C50	170.2	51.0	3.3	162.3	56.0	2.9	153.8	61.5	2.5	144.8	67.5	2.1
	50	CAUC-C60	173.5	47.8	3.6	165.7	52.5	3.1	157.6	57.9	2.7	149.0	63.7	2.3
	60	CAUC-C60	203.5	59.2	3.4	194.1	65.2	3.0	184.2	71.6	2.6	173.6	78.7	2.2
	60	CAUC-C80	206.0	54.5	3.8	197.0	59.9	3.3	187.6	66.1	2.8	177.5	72.7	2.4
	20	CAUC-C20	73.5	20.2	3.6	70.0	22.1	3.1	66.2	24.3	2.7	62.3	26.7	2.3
	20	CAUC-C25	74.8	19.2	3.9	71.5	21.1	3.4	67.7	23.3	2.9	63.9	25.5	2.5
	25	CAUC-C25	91.3	25.8	3.5	86.8	28.3	3.1	82.4	31.0	2.6	77.6	34.1	2.3
	25	CAUC-C30	93.3	24.3	3.8	89.1	26.6	3.3	84.6	29.3	2.9	79.9	32.1	2.5
8	30	CAUC-C30	109.1	30.2	3.6	104.0	33.0	3.1	98.9	36.2	2.7	93.2	39.8	2.3
	30	CAUC-C40	111.1	27.8	4.0	106.3	30.5	3.5	101.4	33.6	3.0	96.1	36.9	2.6
	40	CAUC-C40	146.1	39.5	3.7	139.3	44.0	3.1	132.2	48.5	2.7	124.6	53.2	2.3
	40	CAUC-C50	148.0	38.6	3.8	141.3	42.4	3.3	134.3	46.7	2.9	126.9	51.4	2.5
	50	CAUC-C50	179.9	52.0	3.4	171.5	56.9	3.0	162.8	62.5	2.6	153.3	68.7	2.2
	50	CAUC-C60	183.7	48.5	3.8	175.6	53.4	3.3	167.0	58.7	2.8	158.0	64.6	2.4
	60	CAUC-C60	215.1	60.4	3.5	205.4	66.3	3.1	195.1	72.8	2.7	184.3	80.0	2.3
	60	CAUC-C80	217.9	55.3	3.9	208.6	61.0	3.4	198.6	67.0	3.0	188.4	73.8	2.5
	20	CAUC-C20	77.4	20.6	3.7	73.8	22.6	3.3	70.0	24.7	2.8	65.9	27.1	2.4
	20	CAUC-C25	78.9	19.6	4.0	75.4	21.5	3.5	71.9	23.6	3.0	67.8	25.9	2.6
	25	CAUC-C25	96.4	26.2	3.7	92.0	28.8	3.2	87.2	31.6	2.7	82.4	34.6	2.4
	25	CAUC-C30	98.7	24.6	4.0	94.2	27.0	3.5	89.7	29.7	3.0	84.7	32.5	2.6
10	30	CAUC-C30	115.2	30.7	3.7	110.1	33.7	3.3	104.6	36.9	2.8	98.9	40.4	2.4
	30	CAUC-C40	117.5	28.3	4.1	112.7	31.0	3.6	107.3	34.0	3.1	101.8	37.4	2.7
	40	CAUC-C40	154.0	40.9	3.7	147.0	44.9	3.3	139.6	49.2	2.8	131.7	54.1	2.4
	40	CAUC-C50	156.0	39.3	3.9	149.3	43.1	3.4	142.0	47.4	3.0	134.0	52.1	2.6
	50	CAUC-C50	189.7	52.9	3.6	181.1	57.9	3.1	171.8	63.5	2.7	162.3	69.8	2.3
	50	CAUC-C60	193.9	49.3	3.9	185.6	54.1	3.4	176.6	59.6	3.0	167.1	65.4	2.5
	60	CAUC-C60	227.2	61.6	3.7	216.9	67.6	3.2	206.4	74.1	2.8	195.0	81.4	2.4
	60	CAUC-C80	230.4	56.1	4.1	220.8	61.6	3.6	210.2	67.9	3.1	199.4	74.7	2.7

Notes:
1. Ratings based on sea level altitude and evaporator fouling factor of 0.0176.
2. Consult Trane representative for performance at temperatures outside of the ranges shown.
3. kWi input is for compressors only.
4. COP = Coefficient of Performance (kWo/total kW). Total kW include compressors and control power.
5. Ratings are based on an evaporator temperature drop of 5.6°C.
6. Interpolation between points is permissible. Extrapolation is not permitted.
7. Rated in accordance with ARI Standard 550/590-98.

Performance Data

Part Load Performance

Table PD-5. Part-load performance for CGWF 20-60 ton – 60 Hz in English units

Unit Size		100%	IPLV
20	Tons	19.9	20.3
	kW	15.2	
	EER	15.5	
25	Tons	24.5	20.5
	kW	19.0	
	EER	15.4	
30	Tons	29.2	20.3
	kW	22.8	
	EER	15.3	
40	Tons	39.4	20.7
	kW	30.1	
	EER	15.6	
50	Tons	48.6	19.6
	kW	37.6	
	EER	15.4	
60	Tons	59.4	19.8
	kW	46.5	
	EER	15.2	

Notes:
1. IPLV values are rated in accordance with ARI Standard 550/590-98.
2. EER and IPLV values include compressor and control kW.
3. kW input is for compressors only.

Table PD-6. Part-load performance for CGWF 20-60 ton – 50 Hz in English units

Unit Size		100%	IPLV
20	Tons	16.7	21.0
	kW	12.4	
	EER	16.1	
25	Tons	20.6	20.9
	kW	15.5	
	EER	16.0	
30	Tons	24.5	20.7
	kW	18.5	
	EER	15.9	
40	Tons	33.0	21.3
	kW	24.5	
	EER	16.2	
50	Tons	40.8	20.3
	kW	30.6	
	EER	16.0	
60	Tons	50.1	20.4
	kW	37.6	
	EER	16.0	

Notes:
1. IPLV values are rated in accordance with ARI Standard 550/590-98.
2. EER and IPLV values include compressor and control kW.
3. kW input is for compressors only.

Performance Data

Adjustment Factors

Figure PAF-1. Ethylene glycol performance adjustment factors

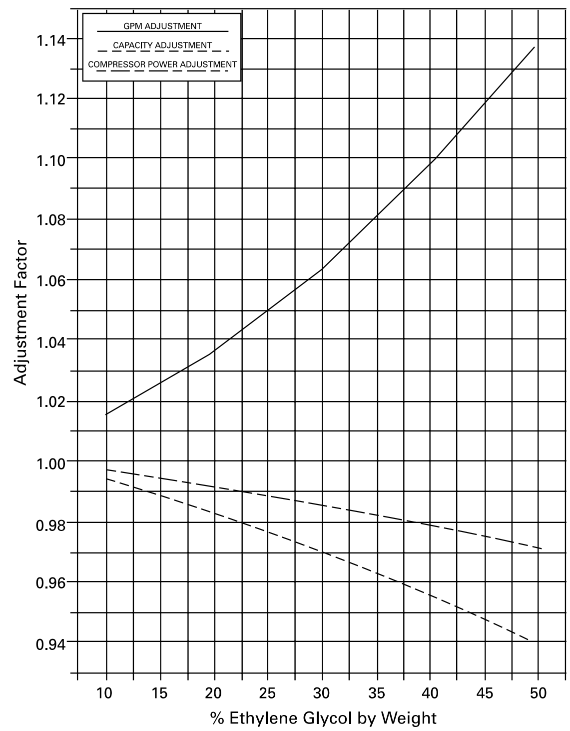
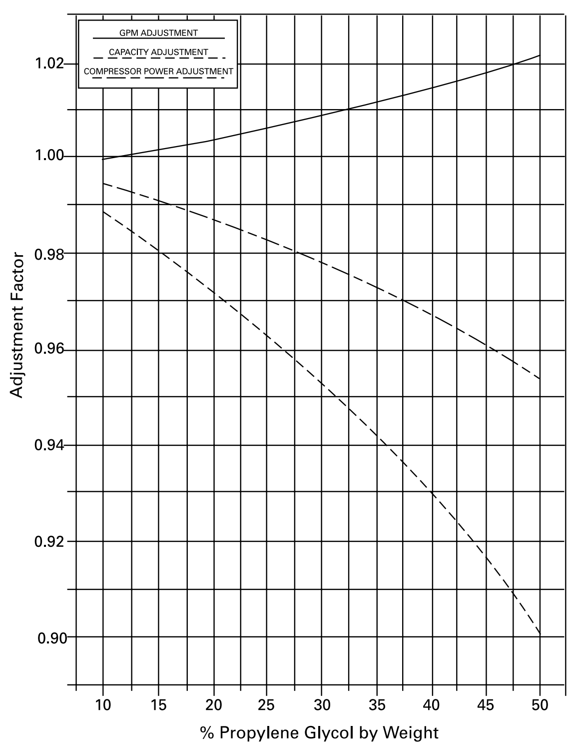


Figure PAF-2. Propylene glycol performance adjustment factors



Performance Data Adjustment Factors

Figure PAF-3. Ethylene glycol and propylene glycol solution freezing points

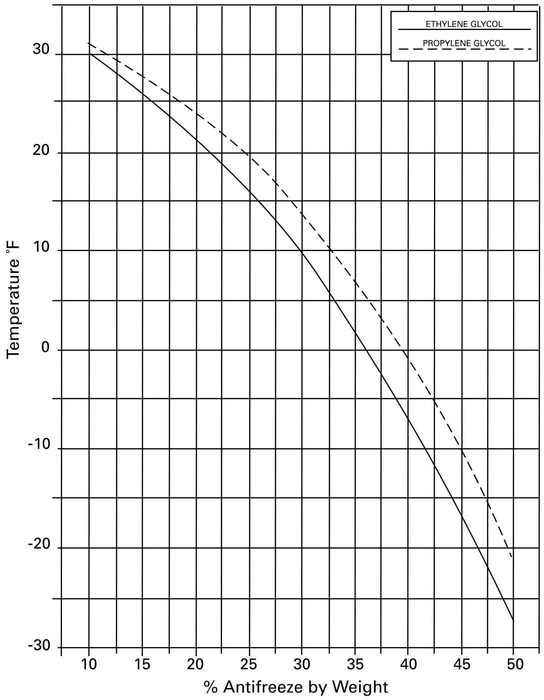


Table PAF-1. Pressure drop correction factor

Leaving Water Temperature	Percent of Ethylene Glycol 0	10	20	30	40	50
0	NA	NA	NA	NA	1.50	1.60
10	NA	NA	NA	1.38	1.46	1.55
20	NA	NA	1.26	1.34	1.42	1.51
30	NA	1.15	1.22	1.30	1.38	1.47
40	1.00	1.12	1.19	1.26	1.34	1.42
50	1.00	1.09	1.16	1.23	1.31	1.39
60	1.00	1.05	1.09	1.12	1.16	1.21

Table PAF-2. Pressure drop correction factor

Leaving Water Temperature	Percent of Propylene Glycol 0	10	20	30	40	50
0	NA	NA	NA	NA	1.63	1.90
10	NA	NA	NA	1.42	1.55	1.74
20	NA	NA	1.24	1.34	1.46	1.62
30	NA	1.11	1.19	1.28	1.39	1.53
40	1.00	1.07	1.15	1.23	1.33	1.45
50	1.00	1.04	1.11	1.19	1.28	1.39
60	1.00	1.00	1.03	1.08	1.13	1.20

Performance Data

Pressure Drops

Chart PD-1. CGWF evaporator

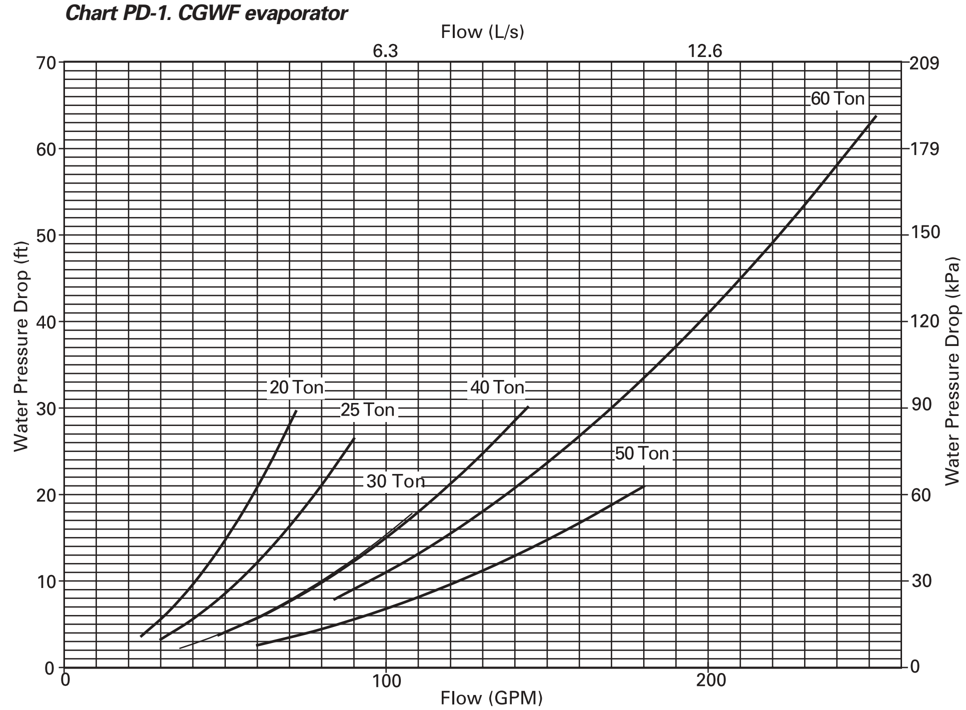
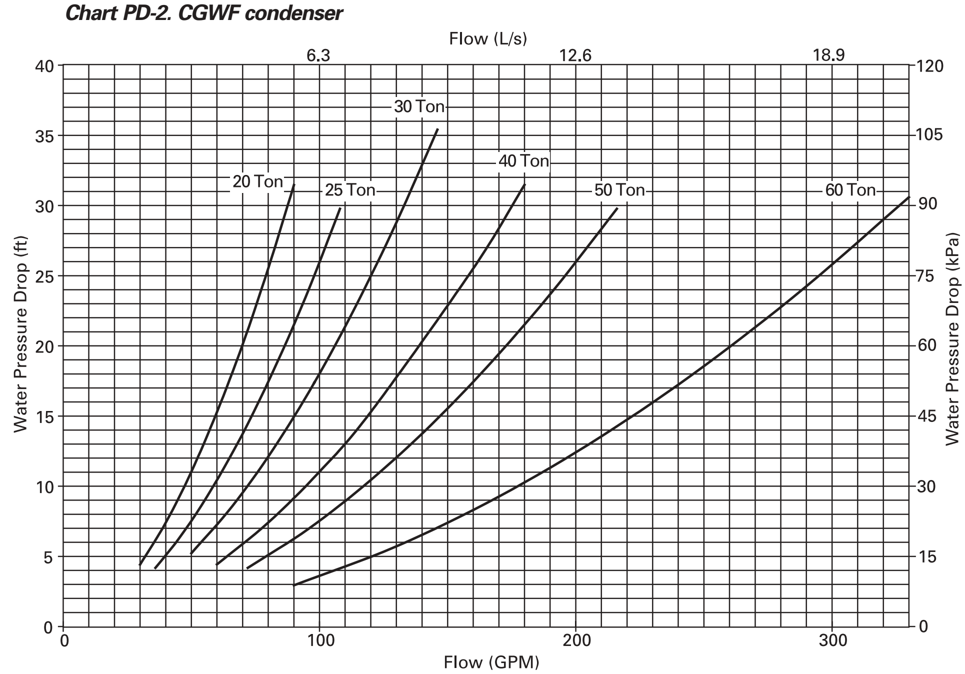


Chart PD-2. CGWF condenser



Electrical Data and Connections

Table E-1. Electrical data for CGWF water-cooled chillers

	Unit Wiring Data					Compressor		Controls
Unit Size	Rated Voltage	Minimum Circuit Ampacity	Maximum Fuse Size	Recommended Dual Element Fuse Size	Quantity	RLA Each	LRA Each	kW
	208-230/60	77	110	100		34	251	0.16
	380/60	38	50	50	2-10	17	142	0.16
20	460/60	32	45	40		14	117	0.16
	575/60	27	40	40		12	94	0.16
	400/50	32	50	50		14	110	0.16
	208-230/60	99	150	125		52/34	376/251	0.16
	380/60	51	70	70	1-10	27/17	215/142	0.16
25	460/60	43	60	60	1-15	23/14	178/117	0.16
	575/60	35	50	45		18/12	143/94	0.16
	400/50	42	50	45		22/14	174/110	0.16
	208-230/60	117	150	150		52	376	0.16
	380/60	61	80	80	2-15	27	215	0.16
30	460/60	52	70	70		23	178	0.16
	575/60	41	50	50		18	143	0.16
	400/50	50	80	80		22	174	0.16
	208-230/60	145	175	175		34	251	0.24
	380/60	72	80	90	4-10	17	142	0.24
40	460/60	60	70	70		14	117	0.24
	575/60	51	60	70		12	94	0.24
	400/50	60	90	90		14	110	0.24
	208-230/60	185	225	225		52/34	376/251	0.24
	380/60	95	110	110	2-10	27/17	215/142	0.24
50	460/60	80	100	100	2-15	23/14	178/117	0.24
	575/60	65	80	80		18/12	143/94	0.24
	400/50	78	110	125		22/14	174/110	0.24
	208-230/60	221	250	250		52	376	0.24
	380/60	115	125	150	4-15	27	215	0.24
60	460/60	98	110	110		23	178	0.24
	575/60	77	90	90		18	143	0.24
	400/50	94	125	150		22	174	0.24

Table E-2. Electrical data for high temperature condenser CGWF chillers and CCAF compressor chillers

	Unit Wiring Data					Compressor		Controls
Unit Size	Rated Voltage	Minimum Circuit Ampacity	Maximum Fuse Size	Recommended Dual Element Fuse Size	Quantity	RLA Each	LRA Each	kW
	208-230/60	88	125	110		39	251	0.16
20	380/60	45	60	60	2-10	20	142	0.16
	460/60	38	50	50		17	117	0.16
	575/60	32	45	40		14	94	0.16
	400/50	38	50	50		17	117	0.16
	208-230/60	112	150	150		58/39	376/251	0.16
25	380/60	59	80	80	1-10	31/20	215/142	0.16
	460/60	50	70	70	1-15	26/17	178/117	0.16
	575/60	40	60	60		21/14	143/94	0.16
	400/50	48	70	70		25/17	178/117	0.16
	208-230/60	131	175	175		58	376	0.16
30	380/60	70	100	90	2-15	31	215	0.16
	460/60	59	80	80		26	178	0.16
	575/60	47	60	60		21	143	0.16
	400/50	56	80	80		25	178	0.16
	208-230/60	166	200	200		39	251	0.24
40	380/60	85	100	100	4-10	20	142	0.24
	460/60	72	80	90		17	117	0.24
	575/60	60	70	70		14	94	0.24
	400/50	72	80	90		17	117	0.24
	208-230/60	209	250	250		58/39	376/251	0.24
50	380/60	110	125	150	2-10	31/20	215/142	0.24
	460/60	93	110	110	2-15	26/17	178/117	0.24
	575/60	75	90	90		21/14	143/94	0.24
	400/50	90	110	110		25/17	178/117	0.24
	208-230/60	247	300	300		58	376	0.24
60	380/60	132	150	150	4-15	31	215	0.24
	460/60	111	125	125		26	178	0.24
	575/60	89	110	100		21	143	0.24
	400/50	106	125	125		25	178	0.24

Notes:
1. Minimum circuit ampacity is 125% of the largest compressor RLA, plus 100% of the remaining compressor(s) RLA, per NEC 440-32 and NEC 440-33.
2. Maximum fuse size is 225% of the largest compressor RLA, plus 100% of the remaining compressor(s) RLA, per NEC 440-33.
3. Recommended dual element fuse size is 175% of the largest compressor RLA, plus 100% of remaining compressor(s) RLA, per NEC 440-33.
4. Use copper conductors only.
5. Voltage Utilization Range:

Rated Voltage	Utilization Range
208-230/60	188-253
380/60	342-418
460/60	414-506
575/60	517-633
400/50	360-440

6. Local codes may take precedence.
7. If unit is ordered with the High Condenser Entering Water Temperature Range (90-130), use CCAF electrical information.

Electrical Data and Connections

Typical Wiring Diagram

WARNING

HAZARDOUS VOLTAGE!

DISCONNECT ALL ELECTRIC POWER INCLUDING REMOTE DISCONNECTS BEFORE SERVICING.

FAILURE TO DISCONNECT POWER BEFORE SERVICING CAN CAUSE SEVERE PERSONAL INJURY OR DEATH.

CAUTION

USE COPPER CONDUCTORS ONLY!

UNIT TERMINALS ARE NOT DESIGNED TO ACCEPT OTHER TYPES OF CONDUCTORS.

FAILURE TO DO SO MAY CAUSE DAMAGE TO THE EQUIPMENT.

CUSTOMER WIRE SELECTION TABLE 1			
POWER WIRE SELECTION TO DISCONNECT SWITCH (1Q1) (CGWF)			
UNIT SIZE	UNIT VOLTAGE	DISCONNECT SWITCH SIZE	CONNECTOR WIRE RANGE
20 TON	200–230 VOLT	100 AMP	#14 – 1/0
50 TON	460 VOLT	100 AMP	#14 – 1/0
20–40 TON	380/400/460 VOLT	100 AMP	#14 – 1/0
20–60 TON	575 VOLT	100 AMP	#14 – 1/0
25–50 TON	200/230 VOLT	250 AMP	#4 – 350 MCM
50–60 TON	380/400 VOLT	250 AMP	#4 – 350 MCM
60 TON	460 VOLT	250 AMP	#4 – 350 MCM
60 TON	200/230 VOLT	400 AMP	2/0–250(2) or 2/0–500(1)
POWER WIRE SELECTION TO DISCONNECT SWITCH (1Q1) (CCAF & CGWF WITH HIGH TEMP CONDENSER)			
UNIT SIZE	UNIT VOLTAGE	DISCONNECT SWITCH SIZE	CONNECTOR WIRE RANGE
20 TON	ALL	100 AMP	#14 – 1/0
25–40 TON	380/400/460 VOLT	100 AMP	#14 – 1/0
25–50 TON	575 VOLT	100 AMP	#14 – 1/0
25–50 TON	200–230 VOLT	250 AMP	#4 – 350 MCM
50–60 TON	380/400/460 VOLT	250 AMP	#4 – 350 MCM
60 TON	575 VOLT	250 AMP	#4 – 350 MCM
60 TON	200/230 VOLT	400 AMP	2/0–250(2) or 2/0–500(1)
POWER WIRE SELECTION TO MAIN TERMINAL BLOCK (1X1)			
UNIT SIZE	UNIT VOLTAGE	TERMINAL BLOCK SIZE	CONNECTOR WIRE RANGE
20–60T ALL	380/400/460/575 VOLT	175 AMP	(1) #14 – 2/0
20–30T CG & 20–25T CC	200/230 VOLT	175 AMP	(1) #14 – 2/0
40–60T CG & 30–60T CC	200/230 VOLT	310 AMP	(1) #6 – 350 MCM
CONTROL WIRE SELECTION FOR 30 VOLT OR LESS CIRCUITS – SEE NOTE 13			
WIRE SIZE		MAXIMUM LENGTH FOR SENSOR LEADS	
14 AWG		5000 FT	
16 AWG		2000 FT	
18 AWG		1000 FT	

GENERAL NOTES:

1. CAUTION–DO NOT ENERGIZE THE UNIT UNTIL CHECK OUT AND STARTUP PROCEDURES HAVE BEEN COMPLETED.

2. CGWF ONLY.

3. ALL UNIT POWER WIRING MUST BE COPPER CONDUCTORS ONLY AND HAVE A MINIMUM TEMPERATURE INSULATION RATING OF 75 DEGREE C. SEE UNIT NAMEPLATE FOR MINIMUM CIRCUIT AMPACITY AND MAXIMUM FUSE SIZE REQUIREMENTS. USE 600 VOLT COPPER CONDUCTORS ONLY. 120 TO 600 VOLT CIRCUIT, PROVIDE AN EQUIPMENT GROUND IN ACCORDANCE WITH APPLICABLE ELECTRIC CODES.

4. THESE FEATURES ARE OPTIONAL AND MAY OR MAY NOT BE PROVIDED. CUSTOMER PROVIDED WIRING FOR ALL STANDARD FEATURES AND OPTIONS IS SHOWN ON THIS DIAGRAM. OPTIONAL FEATURES ARE SO NOTED.

5. OPENING THE EXTERNAL AUTO–STOP CONTACT WILL INITATE A SHUT DOWN SEQUENCE OF THE CHILLER. CLOSURE OF THE CONTACT WILL ALLOW THE CHILLER TO RETURN TO NORMAL AUTOMATIC OPERATION.

6. AN OPENING OF THE EMERGENCY STOP CONTACT WILL SHUT THE CHILLER DOWN IMMEDIATELY AND TRIGGER AN EMERGENCY STOP INPUT DIAGNOSTIC. CLOSURE OF THE CONTACT AND A MANUAL RESET OF THE UNIT CONTROL DIAGNOSTIC WILL ALLOW THE CHILLER TO RETURN TO NORMAL OPERATION.

7. WHEN 1Q1 IS NOT PRESENT THE CUSTOMER MUST WIRE DIRECTLY TO 1X1.

WIRING REQUIREMENTS

8. RECOMMENDED FIELD WIRING CONNECTIONS ARE SHOWN BY DASHED LINES

9. ALL FIELD WIRING MUST BE IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE AND STATE AND LOCAL REQUIREMENTS. EXPORT UNIT WIRING MUST COMPLY WITH LOCAL APPLICABLE CODES.

10. LINE VOLTAGE OPTIONS:
UNIT MOUNTED TERMINAL BLOCK OR DISCONNECT. THE POWER WIRING LUG SIZE PROVIDED ON THE VARIOUS UNITS IS SHOWN IN TABLE 1.

11. AS SHIPPED 200/230 VOLT UNITS, TRANSFORMER (1T1) IS WIRED FOR 200 VOLT OPERATION. IF OTHER VOLTAGES ARE REQUIRED RECONNECT WIRE 29A TO APPROPRIATE TERMINAL. SEE INSET "A".
INTERNATIONAL UNITS ARE SHIPPED WITH TRANSFORMER (1T1) WIRED FOR 380 VOLT OPERATION. IF UNIT IS FOR 415 VOLT OPERATION, RECONNECT AS SHOWN IN INSET "A".

12. ALL CUSTOMER CONTROL CIRCUIT WIRING MUST BE COPPER CONDUCTORS ONLY AND HAVE A MINIMUM INSULATION RATING OF 300 VOLTS. EXCEPT AS NOTED ALL CUSTOMER WIRING CONNECTIONS ARE MADE TO CIRCUIT BOARD MOUNTED TERMINALS WITH A WIRE RANGE OF 14 TO 18 AWG.

13. DO NOT RUN LOW VOLTAGE CONTROL WIRING (30 VOLTS OR LESS) IN CONDUIT WITH 110 VOLT OR HIGHER WIRING. DO NOT EXCEED THE FOLLOWING MAXIMUM RUN LENGTHS FOR A GIVEN SIZE: 14 AWG, 5000 FT; 16 AWG, 2000 FT; 18 AWG, 1000 FT.

14. TRANE TRACER SUMMIT RECOMMENDED WIRE:
TRANE ICS SHIELDED TWISTED PAIR COMMUNICATION CABLE 14–18 AWG. 600V CABLE, 30 VOLT CIRCUIT. THE SUM TOTAL LENGTH OF ALL INTERCONNECTED CABLE SEGMENTS NOT TO EXCEED 5000 FEET. GROUND THE SHIELD AT THE TRACER END ONLY. REFER TO THE IOM FO COMPLETE CABLE AND INSTALLATION REQUIREMENTS. TRANE TRACER SUMMIT MAY ALSO USE LCI WIRING RECOMMENDED BELOW.
LONTALK COMMUNICATION INTERFACE (LCI) RECOMMENDED WIRE:
22 AWG LEVEL 4 UNSHIELDED COMMUNICATION WIRE RECOMMENDED. THE SUM TOTAL LENGTH OF ALL INTERCONNECTED CABLE SEGMENTS NOT TO EXCEED 4500 FEET. CONNECTION TOPOLOGY SHOULD BE DAISY CHAIN. REFER TO BUILDING AUTOMATION SYSTEM (BAS) COMMUNICATION INSTALLATION LITERATURE FOR END OF LINE TERMINATION RESISTOR REQUIREMENTS.

15. THE CONTACTS FOR THESE FEATURES ARE JUMPERED AT THE FACTORY BY JUMPERS W1 & W2 TO ENABLE UNIT OPERATION. IF REMOTE CONTROL IS DESIRED REMOVE THE JUMPERS AND CONNECT TO THE DESIRED CONTROL CIRCUIT.

16. FIELD PROVIDED 115 VOLT 60HZ OR 220 VOLT 50HZ CONTROL POWER SUPPLIES ARE REQUIRED. THE MAX FUSE SIZE FOR ALL FIELD PROVIDED WIRING IS 15 AMPS. GROUND ALL CUSTOMER PROVIDED POWER SUPPLIES AS REQUIRED BY CODE. GREEN GROUND SCREWS ARE PROVIDED IN UNIT CONTROL PANEL.

17. EVAP/CONDENSER WATER PUMP STARTER AUXILIARY CONTACTS TO BE WIRED IN SERIES WITH FLOW SWITCHES.

18. WHEN ORDERED THE OUTDOOR AIR TEMP SENSOR ELECTRONICS IS FACTORY MOUNTED INSIDE THE CONTROL PANEL AND THE IPC BUS IS FACTORY WIRED. THE SENSING BULB IS TO BE FIELD WIRED EXTERNALLY WITH THE SENSOR LEADS EXTENDED BACK TO THE CONTROL PANEL. THESE WIRES CAN BE SPLICED WITH TWO 14–18 AWG 600V WIRES, WITH A MAXIMUM LENGTH OF 1000 FEET (305 METERS), SPLICE AT SENSOR END MUST BE WATER TIGHT. REFER TO UNIT IOM FOR DETAILS.

CONTACT RATINGS AND REQUIREMENTS

19. UNIT PROVIDED DRY CONTACTS FOR THE EVAP/CONDENSER WATER PUMP CONTROL. THE UNIT OPERATING STATUS RELAYS, FAN CONTROL RELAYS AND ICE MAKING STATUS RELAY ARE RATED FOR 7.2 AMPS RESISTIVE, 2.88 AMPS PILOT DUTY, OR 1/3 HP, 7.2 FLA AT 120 VOL 60 HZ, CONTACTS ARE RATED FOR 5 AMPS GENERAL PURPOSE DUTY AT 240 VOLTS.

20. CUSTOMER SUPPLIED CONTACTS FOR ALL LOW VOLTAGE CONNECTIONS MUST BE COMPATABLE WITH DRY CIRCUIT 24 VOLTS DC FOR A 12 MA RESISTIVE LOAD. SILVER OR GOLD PLATED CONTACTS ARE RECOMMENDED.

21. FLOW SWITCH AND INTERLOCK CONTACTS MUST BE ACCEPTABLE FOR USE IN A 120 VOLT 1mA CIRCUIT. OR A 220 VOLT 2mA CIRCUIT.

22. THE FIELD PROVIDED INDICATORS MAY BE RELAYS, LIGHTS OR AUDIBLE DEVICES. EACH FUNCTION IS ASSOCIATED WITH A SPDT RELAY. THE INDICATORS FUNCTIONS MAY BE CONNECTED TO EITHER OR BOTH OF THE NORMALLY OPEN OR NORMALLY CLOSED RELAY CONTACTS OF EACH OF THE 4 SPDT RELAYS ON THE OPTIONAL UNIT OPERATING STATUS MODULE.
THE FUNCTIONS OF THE OPERATING STATUS MODULE RELAYS ARE PROGRAMABLE. SEE IOM FOR DETAILS. DEFAULT FUNCTIONS ARE SHOWN THE NORMALLY OPEN CONTACTS ON EACH RELAY OPERATE AS FOLLOWS:

COMPRESSOR RUNNING —— THE NO CONTACTS CLOSE WHEN COMPRESSOR STATUS FROM STARTER MODULE IS EITHER STARTING OR RUNNING.

MAXIMUM CAPACITY RELAY —— THE NO CONTACTS CLOSE WHEN THERE ARE NO ADDITIONAL STAGES OF LOADING AVAILABLE.

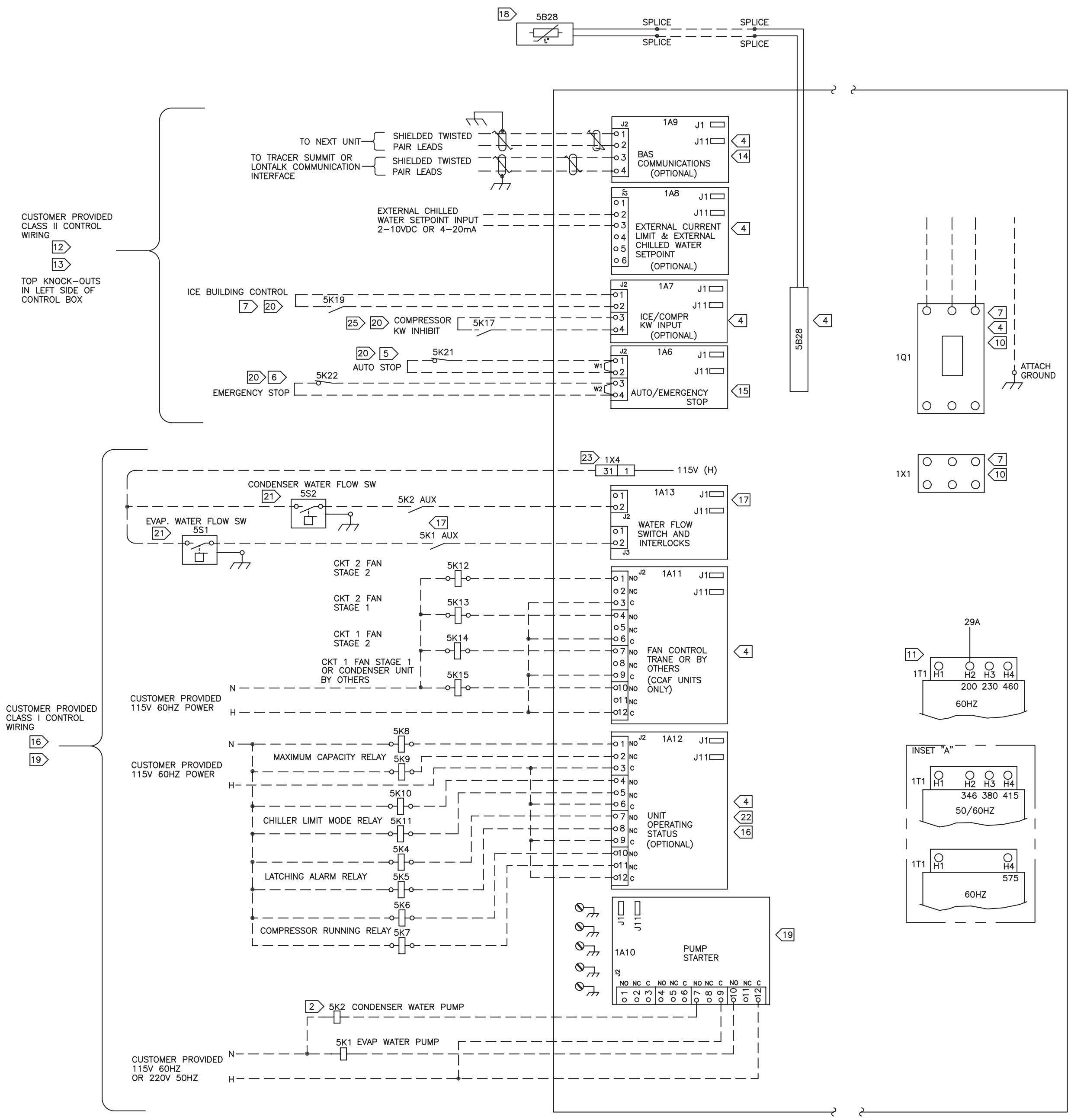
CHILLER LIMIT MODE RELAY —— THE NO CONTACTS CLOSE WHENEVER THE CHILLER HAS BEEN RUNNING IN ONE OF THE UNLOADING TYPES OF LIMIT MODES CONTINUOUSLY FOR THE LAST 20 MINUTES.

LATCHING ALARM RELAY —— THE NO CONTACTS CLOSE WHEN THERE IS AN DIAGNOSTIC THAT HAS CAUSED A CHILLER SHUTDOWN WITH A MANUA RESET REQUIRED.

23. THE FIELD WIRING FOR THE 115V HOT LEG IS TERMINATED TO 1X4 TERMINAL BLOCK. SEE INSTRUCTION LABEL IN CONTROL PANEL FOR WIRE INSERTION INSTRUCTIONS. SPLICE FIELD WIRES TOGETHER AND WIRE TO 1X4.

REPLACEMENT FUSE SIZES						
LOCATION	UNIT VOLTAGE	DESIGNATOR	VOLTS	CLASS	TYPE	AMPS
1T1 PRIMARY	200/60	1F1,1F2	600	CC	FNQ-R	3.2
	230/60	1F1,1F2	600	CC	FNQ-R	3.2
	380/60	1F1,1F2	600	CC	FNQ-R	1.8
	400/50	1F1,1F2	600	CC	FNQ-R	1.8
	460/60	1F1,1F2	600	CC	FNQ-R	1.6
	575/60	1F1,1F2	600	CC	FNQ-R	1.3
1T1 SECONDARY	ALL	1F3	600	CC	FNQ-R	10

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DRAWN BY: PBL ©DATE: 11-12-03	FIELD WIRING CGW/CCA
REPLACES:	
REVISION DATE:	
SIMILIAR TO:	



Electrical Data and Connections Field Layout

NOTES:

1. DASHED LINES INDICATE RECOMMENDED FIELD WIRING BY OTHERS. PHANTOM LINES INDICATE ALTERNATE CIRCUITRY OR AVAILABLE SALES OPTIONS. CHECK SALES ORDER TO DETERMINE IF WIRING IS REQUIRED FOR SPECIFIC OPTIONS.

2. REQUIRED DEVICE AND/OR CIRCUITRY BY OTHERS.

3. REQUIRED DEVICE AVAILABLE FROM TRANE. FIELD INSTALLED

4. OPENING THE EXTERNAL AUTO–STOP CONTACT WILL INITATE A SHUT DOWN SEQUENCE OF THE CHILLER. CLOSURE OF THE CONTACT WILL ALLOW THE CHILLER TO RETURN TO NORMAL.

5. AN OPENING OF THE EMERGENCY STOP CONTACT WILL SHUT THE CHILLER DOWN IMMEDIATELY AND TRIGGER AN EMERGENCY STOP INPUT DIAGNOSTIC. CLOSURE OF THE CONTACT AND A MANUAL RESET OF THE UNIT CONTROL DIAGNOSTIC WILL ALLOW THE CHILLER TO RETURN TO NORMAL OPERATION.

6. THE CONTACTS FOR THESE FEATURES ARE JUMPERED AT THE FACTORY BY JUMPERS W1 & W2 TO ENABLE UNIT OPERATION. IF REMOTE CONTROL IS DESIRED REMOVE THE NOTED JUMPERS AND CONNECT TO THE DESIRED CONTROL CIRCUIT.

7. CUSTOMER SUPPLIED CONTACTS FOR ALL CLASS 2 CONNECTIONS MUST BE COMPATABLE WITH DRY CIRCUIT 24 VOLTS DC FOR A 12 MA RESISTIVE LOAD. SILVER OR GOLD PLATED CONTACTS ARE RECOMMENDED.

8. THE FIELD WIRING FOR THE 115V HOT LEG IS TERMINATED TO 1X4 TERMINAL BLOCK. SEE INSTRUCTION LABEL IN CONTROL PANEL FOR WIRE INSERTION INSTRUCTIONS. SPLICE FIELD WIRES TOGETHER AND WIRE TO 1X4.

GENERAL NOTES:

9. CAUTION–DO NOT ENERGIZE THE UNIT UNTIL CHECK OUT AND STARTUP PROCEDURES HAVE BEEN COMPLETED.

10. CLASS II 30 VAC MAX.

11. THESE FEATURES ARE OPTIONAL AND MAY OR MAY NOT BE PROVIDED. CUSTOMER PROVIDED WIRING FOR ALL STANDARD FEATURES AND OPTIONS IS SHOWN ON THIS DIAGRAM. OPTIONAL FEATURES ARE SO NOTED.

REPLACES	2D CAD	FILE NUMBER	DRAWING NUMBER 2309–7579	REV A
REVISION DATE	THE TRANE COMPANY A DIVISION OF AMERICAN STANDARD INC.	CGW/CCA FIELD LAYOUT DIAGRAM		
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DATE 11–12–03	SIMILAR TO			

⚠ WARNING

HAZARDOUS VOLTAGE!

DISCONNECT ALL ELECTRIC POWER INCLUDING REMOTE DISCONNECTS BEFORE SERVICING.

FAILURE TO DISCONNECT POWER BEFORE SERVICING CAN CAUSE SEVERE PERSONAL INJURY OR DEATH.

CAUTION

USE COPPER CONDUCTORS ONLY!

UNIT TERMINALS ARE NOT DESIGNED TO ACCEPT OTHER TYPES OF CONDUCTORS.

FAILURE TO DO SO MAY CAUSE DAMAGE TO THE EQUIPMENT.

WIRING REQUIREMENTS

12. ALL FIELD WIRING MUST BE IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE AND STATE AND LOCAL REQUIREMENTS. EXPORT UNIT WIRING MUST COMPLY WITH LOCAL APPLICABLE CODES.

13. ALL UNIT POWER WIRING MUST BE COPPER CONDUCTORS ONLY AND HAVE A MINIMUM TEMPERATURE INSULATION RATING OF 75 DEGREE C. SEE UNIT NAMEPLATE FOR MINIMUM CIRCUIT AMPACITY AND MAXIMUM FUSE SIZE REQUIREMENTS. USE 600 VOLT COPPER CONDUCTORS ONLY. 200 TO 600 VOLT CIRCUIT, PROVIDE AN EQUIPMENT GROUND IN ACCORDANCE WITH APPLICABLE ELECTRIC CODES.

14. LINE VOLTAGE OPTIONS:

UNIT MOUNTED TERMINAL BLOCK OR DISCONNECT SWITCH. THE POWER WIRING LUG SIZE PROVIDED ON THE VARIOUS UNITS IS SHOWN IN TABLE 1, ON THE FIELD WIRING DIAGRAM.

15. ALL CUSTOMER CONTROL CIRCUIT WIRING MUST BE COPPER CONDUCTORS ONLY AND HAVE A MINIMUM INSULATION RATING OF 300 VOLTS. EXCEPT AS NOTED ALL CUSTOMER WIRING CONNECTIONS ARE MADE TO CIRCUIT BOARD MOUNTED BOX LUGS WITH A WIRE RANGE OF 14 TO 18 AWG.

16. FIELD PROVIDED 115 VOLT 60HZ OR 220 VOLT 50HZ CONTROL POWER SUPPLIES ARE REQUIRED. THE MAX FUSE SIZE FOR ALL FIELD PROVIDED WIRING IS 15 AMPS. GROUND ALL CUSTOMER PROVIDED POWER SUPPLIES AS REQUIRED BY CODE. GREEN GROUND SCREWS ARE PROVIDED IN UNIT CONTROL PANEL.

17. FLOW SWITCH & INTERLOCK CONTACTS MUST BE ACCEPTABLE FOR USE IN A 120 VOLT 1 mA CIRCUIT OR A 220 VOLT 2 mA CIRCUIT.

18. CHILLED / CONDENSER WATER PUMP STARTER AUXILIARY CONTACTS TO BE WIRED IN SERIES WITH FLOW SWITCHES.

19. WHEN ORDERED THE OUTDOOR AIR TEMP SENSOR ELECTRONICS IS FACTORY MOUNTED INSIDE THE CONTROL PANEL AND THE IPC BUS IS FACTORY WIRED. THE SENSING BULB IS TO BE FIELD WIRED EXTERNALLY WITH THE SENSOR LEADS EXTENDED BACK TO THE CONTROL PANEL. THESE WIRES CAN BE SPLICED WITH TWO 14–18 AWG 600V WIRES, WITH A MAXIMUM LENGTH OF 1000 FEET (305 METERS), SPLICE AT SENSOR END MUST BE WATER TIGHT. REFER TO UNIT IOM FOR DETAILS.

20. TRANE TRACER SUMMIT RECOMMENDED WIRE:
TRANE ICS SHIELDED TWISTED PAIR COMMUNICATION CABLE 14–18 AWG. 600V CABLE, 30 VOLT CIRCUIT. THE SUM TOTAL LENGTH OF ALL INTERCONNECTED CABLE SEGMENTS NOT TO EXCEED 5000 FEET. GROUND THE SHIELD AT THE TRACER END ONLY. REFER TO THE IOM FOR COMPLETE CABLE AND INSTALLATION REQUIREMENTS. TRANE TRACER SUMMIT MAY ALSO USE LCI WIRING RECOMMENDED BELOW.

LONTALK COMMUNICATION INTERFACE (LCI) RECOMMENDED WIRE:
22 AWG LEVEL 4 UNSHIELDED COMMUNICATION WIRE RECOMMENDED. THE SUM TOTAL LENGTH OF ALL INTERCONNECTED CABLE SEGMENTS NOT TO EXCEED 4500 FEET. CONNECTION TOPOLOGY SHOULD BE DAISY CHAIN. REFER TO BUILDING AUTOMATION SYSTEM (BAS) COMMUNICATION INSTALLATION LITERATURE FOR END OF LINE TERMINATION RESISTOR REQUIREMENTS.

21. THE FIELD PROVIDED INDICATORS MAY BE RELAYS, LIGHTS OR AUDIBLE DEVICES. EACH FUNCTION IS ASSOCIATED WITH A SPDT RELAY. THE INDICATORS FUNCTIONS MAY BE CONNECTED TO EITHER OR BOTH OF THE NORMALLY OPEN OR NORMALLY CLOSED RELAY CONTACTS OF EACH OF THE 4 SPDT RELAYS ON THE OPTIONAL UNIT OPERATING STATUS MODULE.
THE FUNCTIONS OF THE OPERATING STATUS MODULE RELAYS ARE PROGRAMABLE. SEE IOM FOR DETAILS. DEFAULT FUNCTIONS ARE SHOWN.
THE NORMALLY OPEN CONTACTS ON EACH RELAY OPERATE AS FOLLOWS:

- COMPRESSOR RUNNING —— THE NO CONTACTS CLOSE WHEN COMPRESSOR STATUS FROM STARTER MODULE IS EITHER STARTING OR RUNNING.
- MAXIMUM CAPACITY RELAY —— THE NO CONTACTS CLOSE WHEN THERE ARE NO ADDITIONAL STAGES OF LOADING AVAILABLE.
- CHILLER LIMIT MODE RELAY —— THE NO CONTACTS CLOSE WHENEVER THE CHILLER HAS BEEN RUNNING IN ONE OF THE UNLOADING TYPES OF LIMIT MODES CONTINUOUSLY FOR THE LAST 20 MINUTES.
- LATCHING ALARM RELAY —— THE NO CONTACTS CLOSE WHEN THERE IS AN DIAGNOSTIC THAT HAS CAUSED A CHILLER SHUTDOWN WITH A MANUAL RESET REQUIRED.

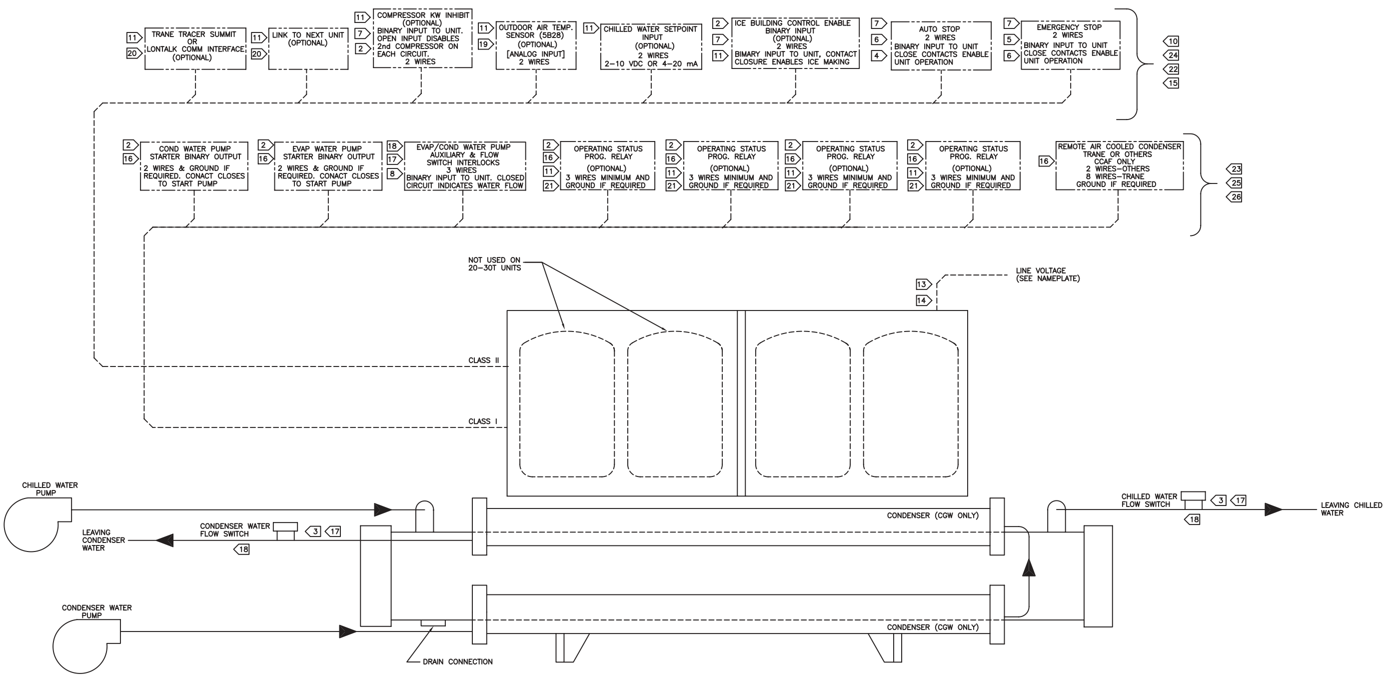
22. THE SIX 1/2" CONDUIT KNOCK–OUTS LOCATED NEAR THE TOP OF THE LEFT–HAND SIDE OF THE CONTROL PANEL ARE FOR USE WITH LOW VOLTAGE 30 VOLT CIRCUIT WIRING.

23. THE SIX 1/2" CONDUIT KNOCK–OUTS LOCATED NEAR THE BOTTOM OF THE LEFT–HAND SIDE OF THE CONTROL PANEL ARE FOR USE WITH 115V CIRCUIT WIRING.

24. DO NOT RUN LOW VOLTAGE CONTROL WIRING (30 VOLTS OR LESS) IN CONDUIT WITH 110 VOLT OR HIGHER WIRING. DO NOT EXCEED THE FOLLOWING MAXIMUN RUN LENGTHS FOR A GIVEN SIZE: 14 AWG, 5000 FT: 16 AWG, 2000 FT; 18 AWG 1000 FT.

25. UNIT PROVIDED DRY CONTACTS FOR THE CONDENSER/CHILLED WATER PUMP CONTROL, THE UNIT OPERATING STATUS RELAYS AND THE AIR COOLED CONDENSER OUTPUTS ARE RATED FOR 7.2 AMPS RESISTIVE, 2.88 AMPS PILOT DUTY, OR 1/3 HP, 7.2 FLA AT 120 VOLTS 60 HZ, CONTACTD ARE RATED FOR 5 AMPS GENERAL PURPOSE DUTY AT 240 VOLTS.

26. CLASS I WIRING .14 AWG, 600 VOLT CONDUCTORS. 115 VOLT CIRCUIT.

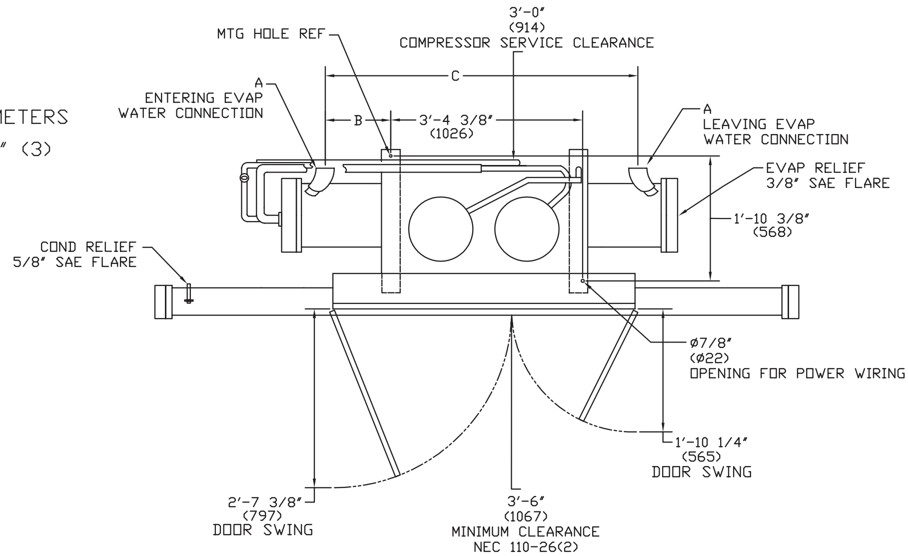


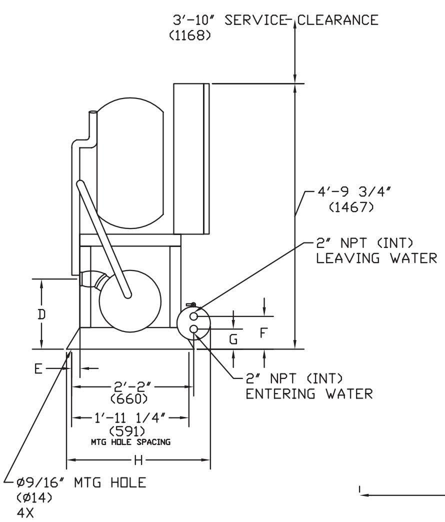
TRANE TRACER SUMMIT OR LONTALK COMM INTERFACE (OPTIONAL)
LINK TO NEXT UNIT (OPTIONAL)
COMPRESSOR KW INHIBIT (OPTIONAL) BINARY INPUT TO UNIT. OPEN INPUT DISABLES 2nd COMPRESSOR ON EACH CIRCUIT. 2 WIRES
OUTDOOR AIR TEMP. SENSOR (5B28) (OPTIONAL) [ANALOG INPUT] 2 WIRES
CHILLED WATER SETPOINT INPUT (OPTIONAL) 2 WIRES 2–10 VDC OR 4–20 mA
ICE BUILDING CONTROL ENABLE BINARY INPUT (OPTIONAL) 2 WIRES BIMARY INPUT TO UNIT, CONTACT CLOSURE ENABLES ICE MAKING
AUTO STOP 2 WIRES BINARY INPUT TO UNIT CLOSE CONTACTS ENABLE UNIT OPERATION
EMERGENCY STOP 2 WIRES BINARY INPUT TO UNIT CLOSE CONTACTS ENABLE UNIT OPERATION
COND WATER PUMP STARTER BINARY OUTPUT 2 WIRES & GROUND IF REQUIRED. CONACT CLOSES TO START PUMP
EVAP WATER PUMP STARTER BINARY OUTPUT 2 WIRES & GROUND IF REQUIRED. CONACT CLOSES TO START PUMP
EVAP/COND WATER PUMP AUXILIARY & FLOW SWITCH INTERLOCKS 3 WIRES BINARY INPUT TO UNIT. CLOSED CIRCUIT INDICATES WATER FLOW
OPERATING STATUS PROG. RELAY (OPTIONAL) 3 WIRES MINIMUM AND GROUND IF REQUIRED
OPERATING STATUS PROG. RELAY (OPTIONAL) 3 WIRES MINIMUM AND GROUND IF REQUIRED
OPERATING STATUS PROG. RELAY (OPTIONAL) 3 WIRES MINIMUM AND GROUND IF REQUIRED
OPERATING STATUS PROG. RELAY (OPTIONAL) 3 WIRES MINIMUM AND GROUND IF REQUIRED
REMOTE AIR COOLED CONDENSER TRANE OR OTHERS CCAF ONLY 2 WIRES–OTHERS 8 WIRES–TRANE GROUND IF REQUIRED
NOT USED ON 20–30T UNITS
LINE VOLTAGE (SEE NAMEPLATE)
CLASS II
CLASS I
CHILLED WATER PUMP
LEAVING CONDENSER WATER
CONDENSER WATER FLOW SWITCH
CONDENSER WATER PUMP
DRAIN CONNECTION
CONDENSER (CGW ONLY)
CONDENSER (CGW ONLY)
CHILLED WATER FLOW SWITCH
LEAVING CHILLED WATER

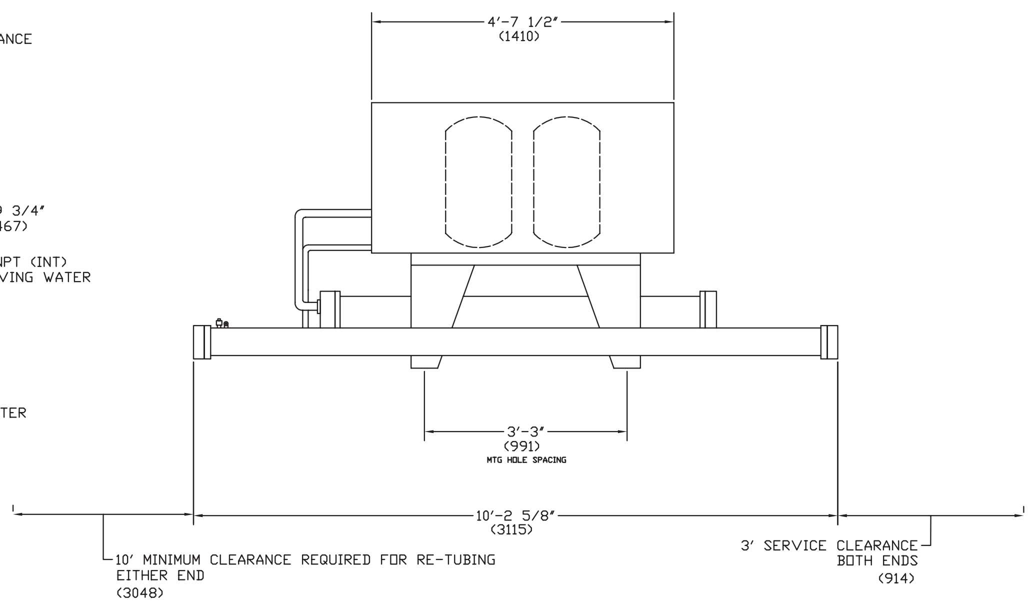
Dimensional Data

CGWF 20-30 Ton

NOTES:
1. DIMENSIONS IN ( ) ARE MILLIMETERS
2. DIMENSIONAL TOLERANCE ±1/8" (3)







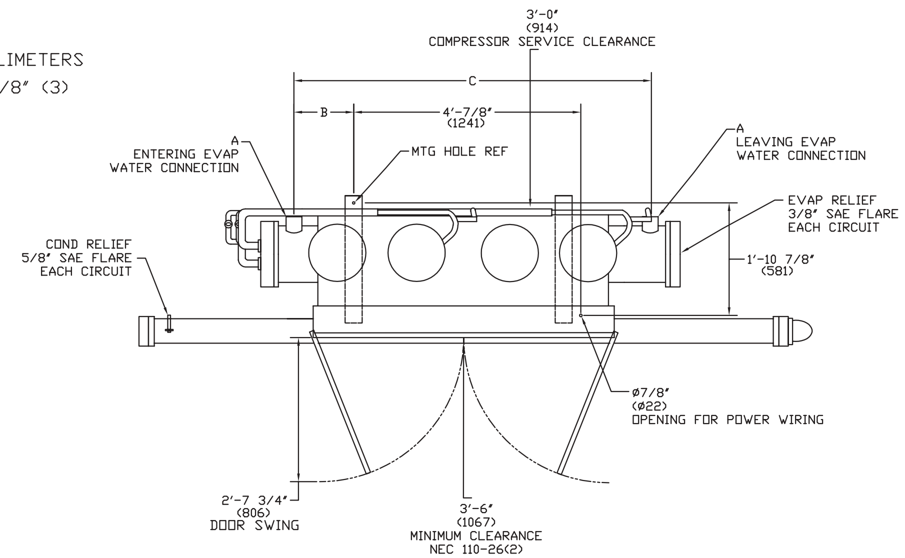
Size	A	B	C	D	E	F	G	H
20 Ton	2" (51)	8 1/2" (216)	4'-8" (1423)	1'-3 3/8" (391)	4 1/8" (105)	8 5/8" (218)	5 5/8" (143)	2' 7 3/8" (797)
25 Ton	2" (51)	8 1/2" (216)	4'-8" (1423)	1'-3 3/8" (391)	4 1/8" (105)	8 5/8" (218)	5 5/8" (143)	2' 7 3/8" (797)
30 Ton	2 1/2" (64)	7 3/4" (197)	4'-6 1/2" (1384)	1'-5 3/8" (441)	2 1/4" (57)	12" (305)	8" (203)	2' 8 3/16" (818)

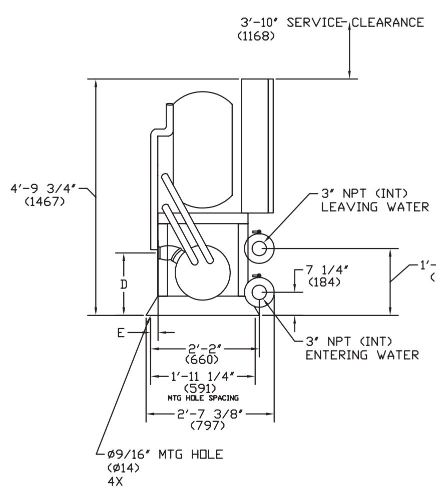
Notes:
1. Dimensions in ( ) are in millimeters.
2. Dimensional tolerance ± 1/4" (6.4).
3. These dimensions for left hand condenser connections.

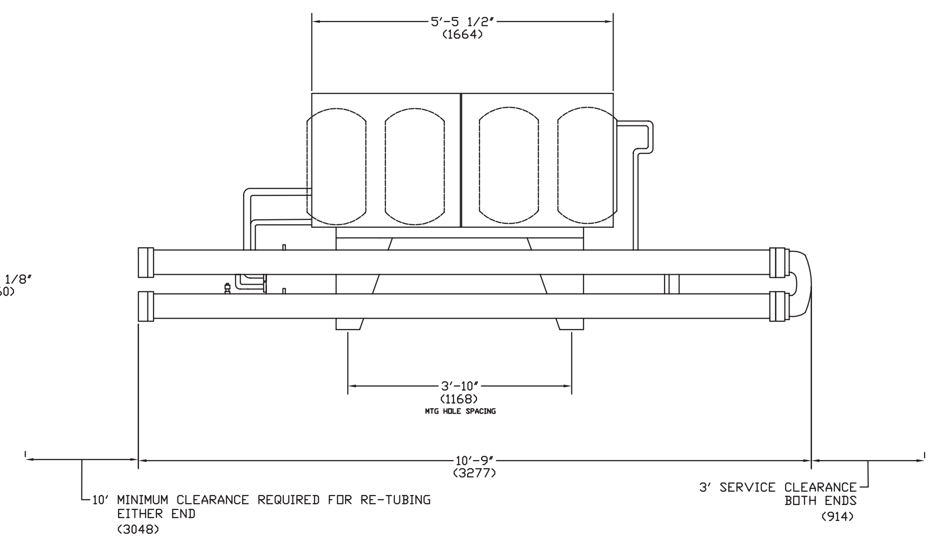
Dimensional Data

CGWF 40-50 Ton

NOTES:
1. DIMENSIONS IN ( ) ARE MILLIMETERS
2. DIMENSIONAL TOLERANCE ±1/8" (3)





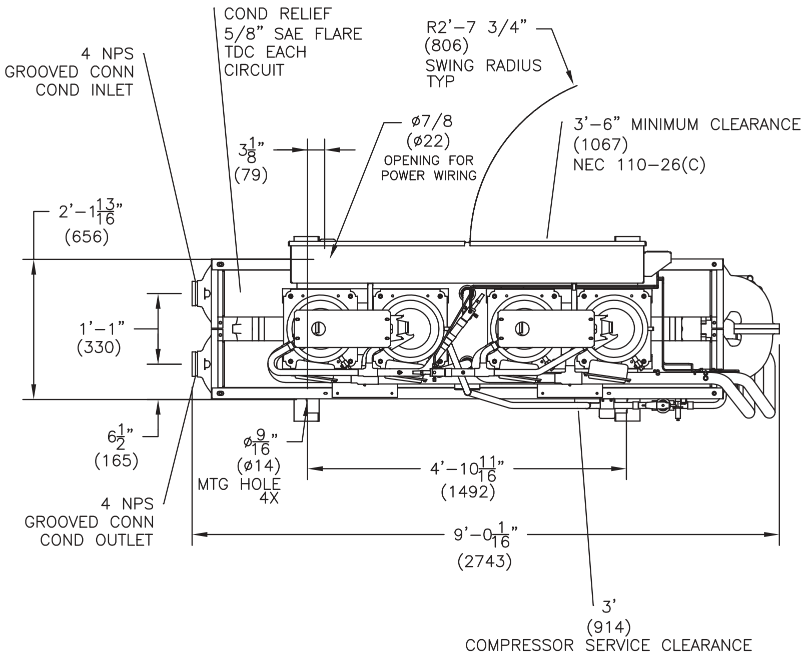


Size	A	B	C	D	E
40 Ton	2 1/2" (64)	1'-3 3/4" (400)	6'-5 1/2" (1968)	1'-4 1/4" (413)	4 3/8" (111)
50 Ton	3" (76)	1'-3 1/2" (394)	6'-5" (1956)	1'-6 1/8" (480)	2 1/2" (64)

Notes:
1. Dimensions in ( ) are in millimeters.
2. Dimensional tolerance ± 1/4" (6.4).
3. These dimensions for left hand condenser connections.

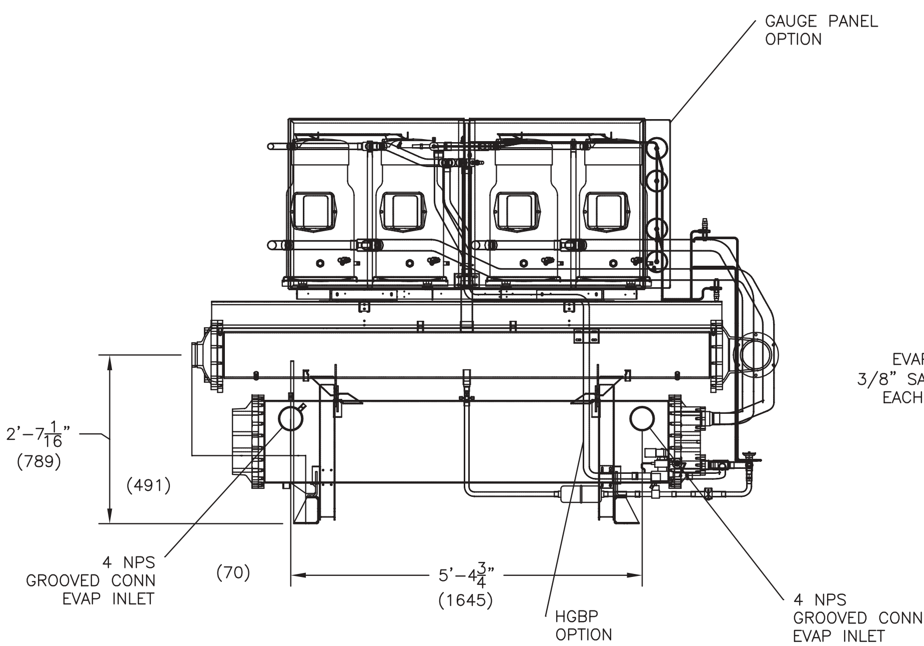
Dimensional Data

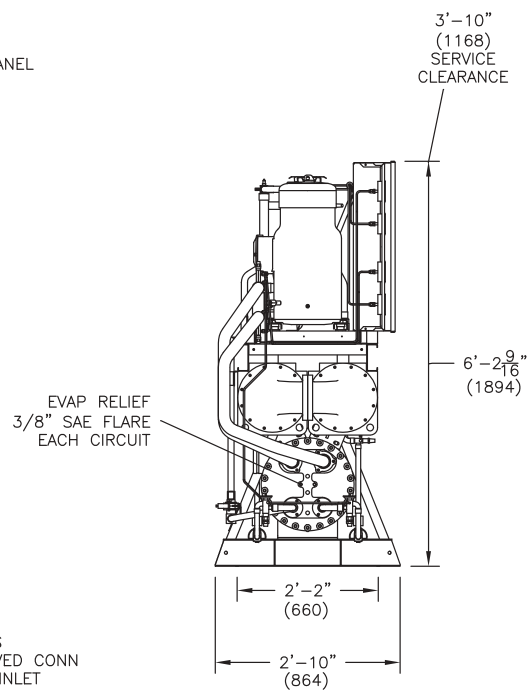
CGWF 60 Ton



NOTES:

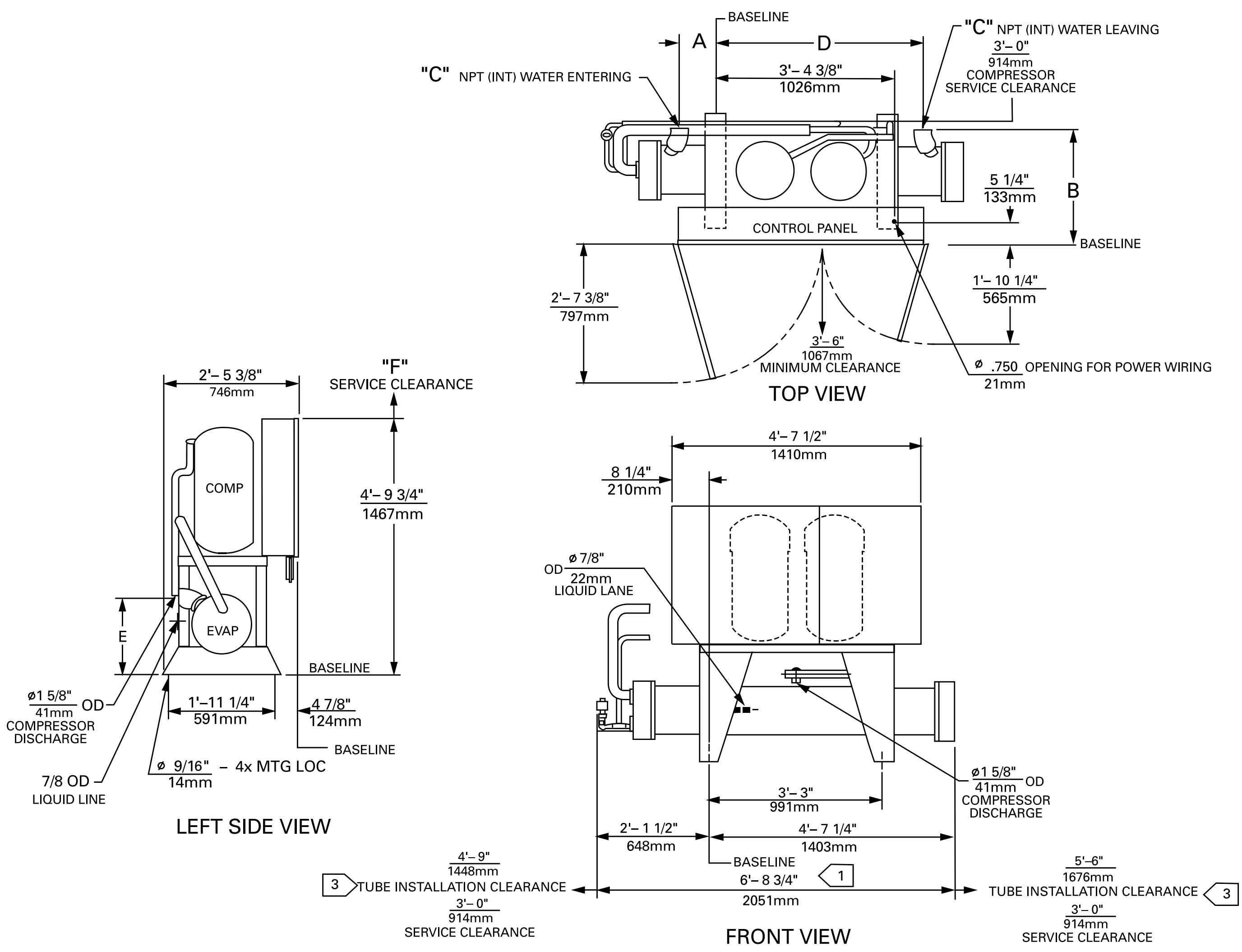
1. DIMENSIONS IN ( ) ARE MILLIMETERS
2. DIMENSIONAL TOLERANCE ±1/8" (3)





Dimensional Data

CCAF 20-30 Ton



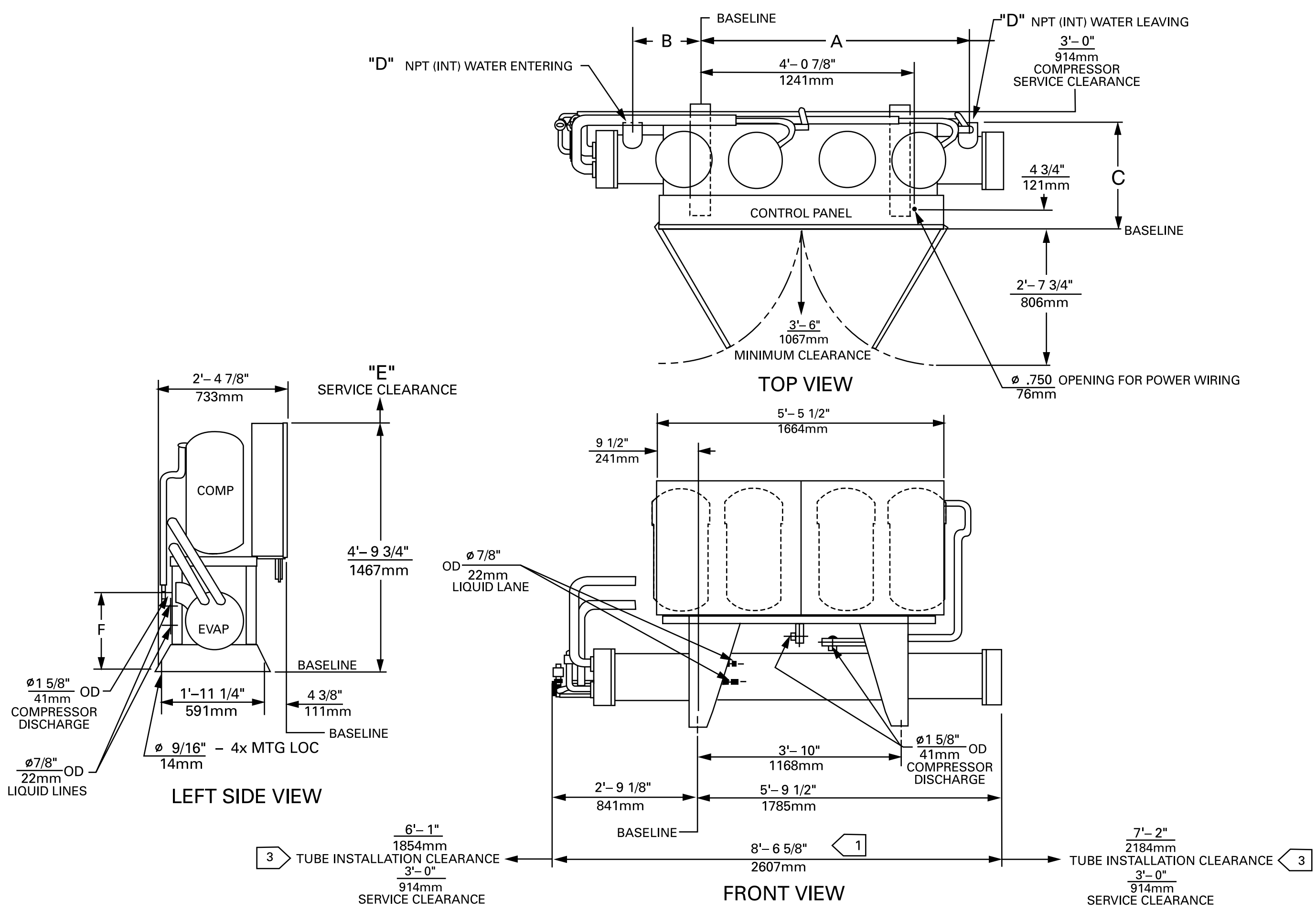
	English Dimensions					
Unit Size	A	B	C	D	E	F
20 Ton	8 1/2″	3′-11 1/2″	2″	2′-0″	1′-3 1/2″	3′-3″
25 Ton	8 1/2″	3′-11 1/2″	2″	1′-11 3/4″	1′-3 1/2″	3′-10″
30 Ton	7 3/4″	3′-10 3/4″	2 1/2″	2′-1 7/8″	1′-5 3/8″	3′-10″

	Metric Dimensions (mm)					
Unit Size	A	B	C	D	E	F
20 Ton	216	1207	51	610	394	1041
25 Ton	216	1207	51	603	394	1041
30 Ton	197	1187	64	657	441	1168

Notes:
1. Add 3/4″ (19 mm) for units with insulation.
2. Dimensional tolerance ± 1/4″ (6.4).
3. Tube installation at either end of evaporator.

Dimensional Data

CCAF 40-60 Ton



	English Dimensions					
Unit Size	A	B	C	D	E	F
40 Ton	5′-1 3/4″	1′-3 3/4″	1′-11 1/4″	2 1/2″	3′-5″	1′-4 1/4″
50 Ton	5′-1 1/2″	1′-3 1/2″	2′-1 1/8″	3″	3′-10″	1′-6 1/8″
60 Ton	5′-1 1/2″	1′-3 1/2″	2′-0 7/8″	3″	3′-10″	1′-6 1/8″

	Metric Dimensions (mm)					
Unit Size	A	B	C	D	E	F
40 Ton	1568	400	591	64	1041	413
50 Ton	1562	394	638	76	1168	480
60 Ton	1562	394	632	76	1168	460

Notes:
1. Dimensions in ( ) are in millimeters.
2. Add 3/4″ (19 mm) for units with insulation.
3. Dimensional tolerance ± 1/4″ (6.4).
4. Tube installation at either end of evaporator.

Weights

Table W-1. Weights, CGWF chillers

Unit		20	25	30	40	50	60
Operating Wt.	(pounds)	1694	1757	2249	2746	2977	3905
	(kilogram)	768	797	1020	1246	1350	1771
Shipping Wt.	(pounds)	1522	1600	2014	2366	2626	3376
	(kilogram)	690	726	914	1073	1191	1531

Table W-2. Weights, CCAF compressor chillers

Unit		20	25	30	40	50	60
Operating Wt.	(pounds)	1004	1079	1274	1509	1808	1982
	(kilogram)	456	490	579	685	821	900
Shipping Wt.	(pounds)	1430	1605	1836	1792	2166	2494
	(kilogram)	649	729	834	814	984	1133

Mechanical Specifications

General
All scroll chillers are factory tested and monitored for power and control operation (CGWF only). CGWF units ship with a full operating charge of refrigerant and oil. CCAF units ship with a full operating charge of oil. Exposed surfaces are painted with an air-dry beige primer-finisher prior to shipment.

Compressor-Motor
Direct-drive, hermetic, 3600 rpm, 60 Hz [3000 rpm, 50 Hz] fixed compression, scroll compressors (20 to 30 tons - two compressors; 40 to 60 tons - four compressors). Each compressor has: centrifugal oil pump, oil level sightglass, oil charging valve, two point lubrication for each motor bearing, flooded lubrication for the journal and thrust bearings, and a check valve on the scroll discharge port.

Motor is suction gas-cooled, hermetically sealed, two-pole, squirrel cage induction type.

Evaporator
Shell and tube design with seamless copper tubes roller expanded into tube sheets. Designed, tested and stamped in accordance with ASME Code for refrigerant side working pressure of 300 psig. Water side working pressure is 300 psig for CGWF 20-50 and CCAF 20-60, 215 psig for CGWF 60. One water pass with a series of internal baffles. Each shell includes drain connections, entering and leaving temperature sensors, and ¾ inch Armaflex II (or equal) insulation (K= 0.26).

Condenser (CGWF only)
Shell and tube design with seamless internally enhanced copper tubes. Designed, tested and stamped in accordance with ASME Code (CGWF 60 only) the refrigerant side working pressure of 450 psig. Water side working pressure is 300 psig for CGWF 20-50, 150 psig for CGWF 60. Two pass construction with six-inch diameter shell (20 to 30 tons). One pass construction with two separate condensers connected in series (40 to 60 tons). Each condenser includes a subcooler circuit. Tubes are cleanable and replaceable.

Refrigerant Circuit
Each refrigeration circuit shall be completely independent and shall include liquid line and discharge line service valves, filter dryer, combination moisture indicator-sightglass, charging port, insulated suction line, liquid line solenoid valve and thermal expansion valve.

Isolation valves provide means of isolating refrigerant charge in either the high or low pressure side while servicing. One refrigerant circuit on 20 to 30 tons; two refrigerant circuits on 40 to 60 tons.

Condenserless units (CCAF) shall be equipped with discharge check valve and moisture indicator sightglass.

Unit Controls (CH530)
The microprocessor-based control panel is factory-installed and factory-tested. Chilled water reset based on return water is standard.

The CH530 microprocessor automatically acts to prevent unit shutdown due to abnormal operating conditions associated with low evaporator refrigerant temperature, high condensing temperature, and/or motor current overload. If an abnormal operating condition continues and the protective limit is reached, the machine should shut down.

The panel includes machine protection shutdown requiring *manual reset* for the following conditions:
- low evaporator refrigerant temperature and pressure
- high condenser refrigerant pressure
- critical sensor or detection circuit faults
- motor current overload
- high compressor discharge temperature
- lost communication between main processor and LLID
- electrical distribution faults: current loss or phase reversal
- external and local emergency stop
- starter contactor interrupt failure

The panel also includes machine protection shutdown with *automatic reset* for the following correctable conditions:
- power loss
- loss of evaporator or condenser water flow

When a fault is detected, the control system conducts more than 60 diagnostic checks and displays results. The display will identify the fault, indicate date, time, and operating mode at time of occurrence, and provide type of reset required and a help message. The diagnostic history will display the last ten diagnostics with their times and dates of occurrence.

Mechanical Specifications

DynaView Panel
Factory-mounted to the control panel door, the operator interface has an LCD touch-screen display for operator input and information output. This interface provides access to the following information: evaporator report, condenser report, compressor report, ASHRAE Guideline 3 report, main, chiller, feature setting, manual control setting and display setting. All diagnostics and messages are displayed in “clear language.”

Data contained in available reports includes:
- water and air temperatures
- refrigerant pressure and temperatures
- flow switch status
- compressor starts and run-time

All necessary settings and setpoints are programmed into the microprocessor-based controller via the operator interface. The controller is capable of receiving signals contemporaneously from a variety of control sources, in any combination, and priority order of control sources can be programmed. The control source with priority determines active setpoints via the signal it sends to the control panel. Control sources may be:
- the local operator interface (standard)
- a 4-20 mA or 2-10 VDC signal from an external source (interface optional; control source not supplied)
- Trane Tracer Summit™ system (interface optional)
- LonTalk LCI-C (interface optional; control source not supplied)

Starter
The unit control panel contains both a control section and a starter section. The panel is a painted, NEMA 1 enclosure. The starter section contains: top access for power wiring, single point power hook-up, three-phase solid-state overload protection, customer wired grounding lug, and control power transformer with fused protection.

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File Number	CG-PRC012-EN 104
Supersedes	CG-PRC011-EN 102
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